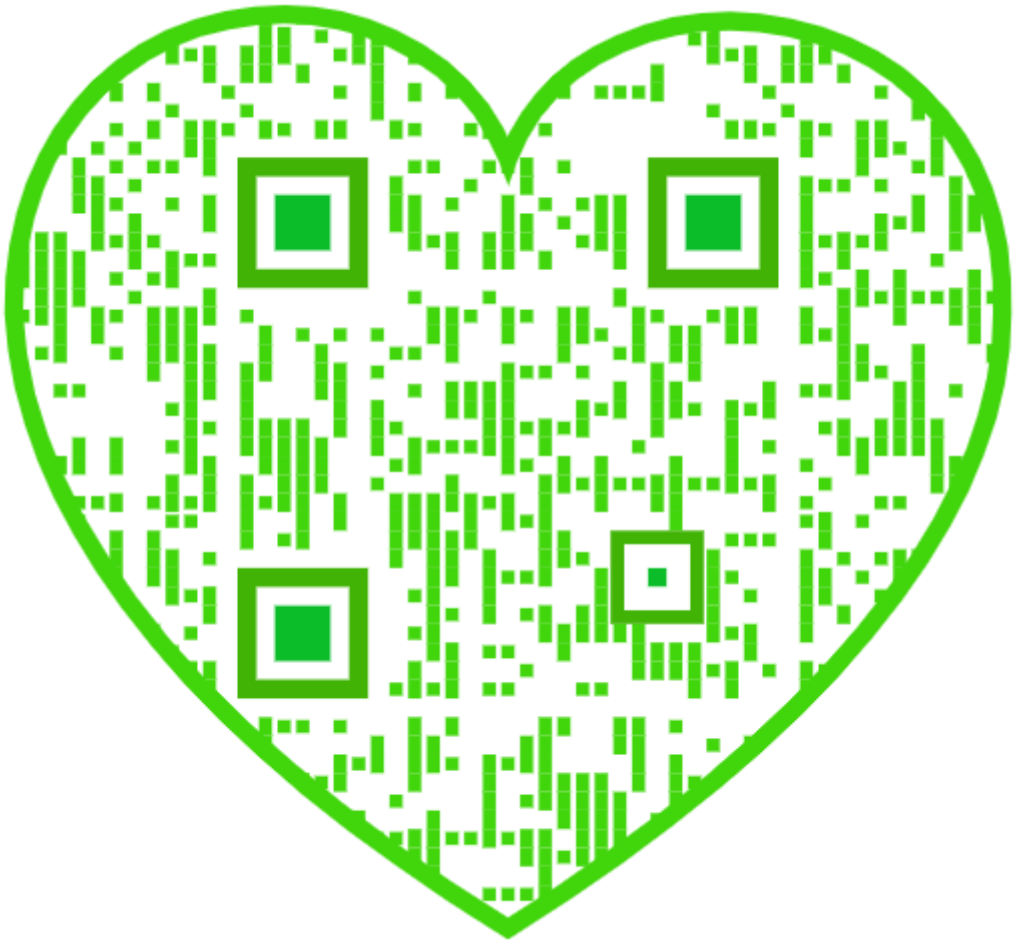

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OF CALIFORNIA

PACIFIC COAST STATES

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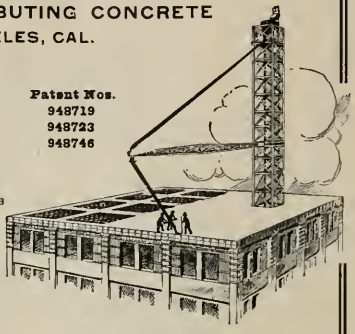

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ARCHITECTS' SPECIFICATION INDEX

(For Index to Advertisements, see next page)

AIR CLEANERS
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C. F. Weber & Co.....365 Market St., S. F.

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An Index to the Advertisements

American Mason Safety Tread 131
American Paint Co. 26
American Revolving Door.. 129
American Rolling Mill Co.... 32
American Sheet & Tin Plate Co. 21
Ames-Irvin Co..... 169
Amweg, Frederick J..... 127
Angelus Hotel..... 164
Armstrong Cork Co..... 170
Ashlock Door Guard..... 160
Atlantic Fireproofing Co..... 130
Atlas Heating and Ventilating Co., Inc..... 125
Atlas Portland Cement Co... 34
Bacon, Ed. R..... 44
Bay Development Co..... 166
Beandet, Geo. E..... 149
Beler Heater Co..... 122
Berger Mfg. Co., The..... 163
Berry Bros..... 4
Bill & Jacobsen 162
Bird, F. W. & Son..... 4
Biturine Co..... 44
Blaisdell Machinery Co..... 162
Bluxome & Co..... 149
Bosch, Hermann..... 122
Bowser & Co., S. F..... 145
Boxton, Geo. W..... 171
Braun, J. G..... 40
Breite, W. W..... 122
Brick Builders' Bureau .. 22
Briggs Bituminous Paint Co.. 28
Brode Iron Works 12
Brown Hoisting MachineryCo., 18
Building Material Co., The, Inc. 6
Butte Engineering Co..... 122
Burlington Venetian Blind Co.153
C. Jorgenson & Co..... 160
Cabot, Samuel (Incorporated). 18
California Air Purifying Co... 141
Calif. Artistic Metal & Wire Co 14
California Bldg. Material Co.. .....Second Cover
Calif. Corrugated Culvert Co. 134
California Granite Co..... 163
California Photo Engraving Co 170
California Plumbing Supply Co..... 43
California Sales & Supply Co.. 154
Calif. Safety Fireproof Co.... 22
Canton Manufacturing Co.... 158
Central Electric Co..... 125
Central Iron Works..... 41
Ceresit Waterproofing Co..... 3
Chowen, W. A..... 170
City Supply Co., Inc., ... 149
Clark-Ludwig..... 159
Clark, N., & Sons..... 29
Clinton Fireproofing Co..... 159
Coleman, Alex..... 170
Colonial Fireplace Co..... 43
Columbia Marble Co..... 10
Commary-Peterson Co..... 159
Comyn-Mackall & Co..... 28
Concrete Appliances Co..... 2
Cook, H. N., Belting Co.... 35
Cowell Lime & Cement Co.... 154
Crane Co..... 43
Crosett & Eastman..... 162
Cutler Mail Chute Co..... 38
Dahlstrom Metalic Door Co.. 140
Davis-Rogers Co..... 168
Delta Construction Co..... 130
De Rome, Louis 122
Diamond Brick Co..... 28
Dieckmann Hardwood Co.... 123
Dixon, Joseph Co..... 9
Douglas, John, Co..... 43
Dunham Co., C. A..... 12
Dyer Bros 39
Edwards, Burt E..... 154
Elevator Supply and Repair Co. 151
Electric Agencies Co..... 125
Engstrum, F. O..... 169
Fess System..... 170
Fibrestone and Roofing Co... 11
Fidelity and Deposit Company of Maryland 125
Finch, Chas. M..... 154
Fink & Schindler Co., The.... 132
Fisher Tile Co..... 170
Flagg, Edwin H., Scenic Co.... 7
Florentine Art Studio..... 166
Forbes, A. J. & Son..... 157
Foster, Vogt Co..... 138
Fuller, W. P., Co..... 27
General Contractors Ass'n... 148
Giant Suction Cleaner Co 161
Cladding, McBean & Co..... 30
Glauber Brass Mfg. Co..... 135
Glidden Varnish Co..... 137
Globe Indemnity Co. 166
Goheen Mfg. Co..... 17
G. G Concrete Products.... 171
Golden Gate Brick Co..... 14
Golden Gate Structural and Ornamental Iron Works.... 16
Gordon Construction Co..... 166
Graham & Jensen..... 171
Grant Gravel Co 7
Harron, Rickard & McCone... 10
Haslett Co., The..... 156
Hercules Waterproofing Cem. Co..... 26
Higginson Co., Inc..... 140
Hill-Canton Dryer Co..... 165
Hilliard, C. J., Co..... 42
Holm & Son..... 157
Holmes Lime Co..... 9
Home Heating Co..... 122
Home Mfg. Co..... 138
Howard, P. F..... 162
Howard Clock Co..... 145
Hughson & Donnolly 138
Hunt, Robt. W. & Co..... 129
Hunter & Hudson 130
Ills, John G..... 162
Industrial Engineering Co.... 15
Insley Co..... 25
Iroquois Iron Works..... 42
Jarvis, J. P..... 159
Jenkins Bros..... 153
Johnson, S. T..... 168
Judson Mfg. Co..... 42
Kauffman Heating Co 17
Kawneer Mfg. Co..... 19
Keyless Lock Co..... 141
Kieffel & Esser.....2d Cover
Kimball, Sherman & Co.162 and 17
Klenck, F J..... 171
Koehring Mixer 37
Kohler, Company..... 19
Krebs & Co..... 167
Langford, Felts & Myers.44, 162
Lettich, A..... 125
Lettich, J. M..... 162
Levensaler-Spier Corp'n..... 29
Lilley & Thurston..... 3rd Cover
Liquid Stone Cement Co. 31
Litholid Products Co..... 141
Livermore & Co., Norman B. 169
Livermore Fire Brick Co..... 30
Los Angeles Pressed Brick Co.142
Lowrie Safe Co..... 160
Lynch, A..... 166
Mackenzie Roof Co..... 127
Majestic Furnace Co..... 131
Mangrum & Otter..... 44
Mark-Lally Co..... 154
Marsh-Capron Co..... 36
Marshall & Stearns Co..... 39
Maris Hardwood Co..... 123
Massachusetts Bonding and Insurance Company..... 130
McGraw, W. J..... 166
McLeran & Peterson..... 138
Meek, T. H..... 136
Meese & Gottfried Co..... 133
Moller & Schumann Co..... 20
Monarch Iron Works..... 138
Monson Bros. 171
Mortenson Construction Co. 132
Mott Iron Works..... 149
Nason, R. N., & Co..... 171
Nathan, Dohrmann Co. .. 127
National Lumber Co..... 139
Nelson, N. O..... 134
New York Belting & Packing Co., Ltd 126
Niles Sand, Gravel & Rock Co. 147
Norris Co., L. A.Inside Front Cover
Olinger, A. M..... 13
Olive & Leary..... 130
Otis Elevator Co.....Back Cover
Pacific Coast Casualty Co.... 168
Pacific Fire Extinguisher Co... 141
Pacific Gas & Electric Co..... 156
Pacific Hardware and Steel Co. 149
Pacific Imp. Co. Outside Back Cover
Pacific Rolling Mills..... 41
Pacific Structural Iron Works.. 171
Pacific Sewer Pipe Co..... 30
Paraffine Paint Co..... 143
Parcells & Cook..... 182
Parrott & Co..... 2-3-33
Parry Stone Co..... 157
Patrick-Nelson Co..... 159
Petersen, H. L..... 171
Petersen-James Co..... 122
Petrovffsky, John..... 138
Pitcher Door Hanger 158
Pittsburg Heater Co..... 148
Pneulectric Co..... 149
Portland Pile Co..... 168
Pratt Building Material Co. 121
Prometheus Electric Co..... 35
Ralston Iron Works..... 41
Ransome Concrete Co..... 130
Reliance Ball-Bearing Door Hanger..... 140
Richards-Wilcox Mfg. Co..... 144
Rickon, F. J..... 159
Rodriguez Y Villa Co., A..... 158
Roebling, Jno. A..... 38
Rolandi, F..... 149
Roman, C..... 160
Rudgear-Merle Co..... 147
Russell & Erwin Mfg. Co..... 5
Sac'mento Sandstone Brick Co. 30
Samson Cordage Works..... 130
S. F. Metal Stamping and Corrugating Co..... 151
S. F. Elevator Co..... 162
S. F. Pioneer Varnish Works.... 23
Santa Fe Lumber Co..... 165
Sarsi, O. S..... 127
Sartorious & Co..... 38
Scarrett, H. M..... 159
Schoenfeld Marble Co..... 156
Schrader Iron Works..... 170
Scott, Walter..... 157
Searight, F. H..... 11
Shreiber & Sons Co..... 38
Silver Lake Sash Cord Co..... 138
Spencer Elevator Co..... 150
Standard Co..... 28
Standard Electric Time Co. Insert A
Standard Oil Co..... 24
Standard Port. Cement Corp. 27
Standard Varnish Works..... 139
Steel Protected Concrete Co... 146
Steiger Terra Cotta & Pottery Works..... 29
Stephenson, Edwnrd..... 154
Strahle Manufacturing Co.... 165
Sunset Lumber Company.... 165
Sutton, John C., Co..... 125
Taylor & Co..... 138
Trost, Robert..... 168
Tozer Company..... 161
Trussed Concrete Steel Co. 172
Tuec Co..... 152
Turner, C. A. P..... 15
Union Hardware and Metal Co. 166
Union Metal Corner Co..... 20
United Materials Co. 128
U. S. Metal Products Co..... 45
United States Steel Product Co. 155
Universal Safety Tread Co.... 42
Vallejo Brick Co..... 127
Van Dorn Iron Co..... 21
Van Emon Elevator Co..... 4
A. R. Y. Villar Co..... 168
Variety Mfg. Co..... 151
Vonnegut Hardware Co..... 23
Vulcan Iron Works..... 40
Wadsworth, Howland & Co.. 31
Wallace Machy. Co..... 26
Ward & Goodwin..... 159
Watson Mantel & Tile Co..... 166
Weber, C. F. & Co..... 144
West Coast Wire & Iron Wks. 168
Western Builders' Supply Co.. 37
Western Furnace Co..... 125
Western Iron Works..... 41
West, M. G..... 130
White Bros. 121
Williams Bros. & Henderson... 169
Williams, H. S..... 154
Wittman, Lyman & Co..... 125
Woods & Huddart..... 147
Yager Metal Works..... 157
Zelinsky, D..... 157

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

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F. J. Klenck.....Sharon Bldg., S. F.

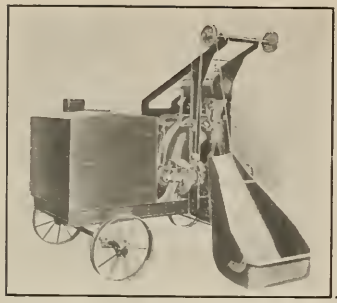
CONCRETE MIXERS
Austin Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., the Beebe Company, Portland and Seattle, and P. B. Engh, Los Angeles.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., S. F.
Ransome Mixers, sold by Norman B. Livermore & Co....Metropolis Bank Bldg., S. F.
Smith Mixers sold by Parrott & Co., San Francisco, Los Angeles and Portland.
Marsh-Capron Mixers, sold by Langford, Bacon & Myers, Rialto Bldg., S. F.
Koehring Mixer, sold by Harron, Rickard & McCone, San Francisco.

CONCRETE PILES
Harron, Rickard & McCone, Townsend Street, San Francisco.
Portland Concrete Pile Co., 754 Phelan Bldg., S. F.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle

Specify... For Plastering
HOLMES DIAMOND SANTA CRUZ LIME
PHONE KEARNY 2220
The Holmes Lime Co.
Guaranteed Against Pitting or Popping
Monadnock Bldg., San Francisco



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SAN FRANCISCO — LOS ANGELES

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE REINFORCEMENT—Cont'd.
Clinton Welded Reinforcing System, L. A. Norris, Monadnock Bldg., S. F.
"Kahn System," see advertisement on page 152 this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., S. F.
Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

CONCRETE BRICK AND TILE
Golden Gate Concrete Products Co., Inc. 404 Rialto Bldg., S. F.

CONCRETE CHIMNEYS AND SILOS
Delta Construction Co., 302 Forum Bldg., Sacramento Cal.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Liquid Stone Paint Co., Hearst Bldg., S. F.
"Concreta," sold by W. P. Fuller & Co., S. F.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
Moller & Schumann...1023 Mission St., S. F.

CONTRACTORS, GENERAL
Commary-Peterson Co., Inc., 46 Kearny St., S. F.
F. J. Klenck.....Sharon Bldg., S. F.
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Foster, Vogt Co.....Sharon Bldg., S. F.
F. Rolandi.....Bank of Italy Bldg., S. F.
Geo. W. Boxton.....Hearst Bldg., S. F.
McLaren & Peterson.....Sharon Bldg., S. F.
Higginson Co., Inc., 804 Humboldt Bank Bldg., S. F.
Howard S. Williams.....Hearst Bldg., S. F.
Graham & Jensen....185 Stevenson St., S. F.
Ransome Concrete Co., 1218 Broad'y, Oakland
F. J. Rickon, C. E., 1859 Geary St., S. F.

CONTRACTORS, GENERAL—Continued
Robert Trost....26th and Howard Sts., S. F.
Williams Bros. & Henderson, Holbrook Bldg., S. F.
Burt T. Owsley....311 Sharon Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal.
Ward & Goodwin.....Sharon Bldg., S. F.

CORK TILING
David J. E. Kennedy, Inc. Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., 971 Howard St., S. F.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Goheen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing, manufactured by Hercules Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Lithoid Product Company, Merchants Exchange Bldg., S. F.
Trus-Con Damp proofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Paheo" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F.
Liquid Stone Paint Co....Hearst Bldg., S. F.
Standard Co.....268 Market St., S. F.

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Seven Different Grades—Superior Finish—Moderate Price
Used in the New San Francisco Hall of Justice, Merchants Exchange Building. Alaska Commercial Building, and others.

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268 MARKET STREET, Rooms 201-202 SAN FRANCISCO, CAL.

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SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.
Richards-Wilcox Mfg. Co.....Aurora, Ill.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.
Spencer Elevator Company, 173 Beale St., S. F.
Excelsior Dumb Waiters, manufactured by R. M. Rodgers Co., Brooklyn; M. E. Hammond, 217 Humboldt Bank Bldg., S. F.

ELECTRICAL CONTRACTORS
J. M. Lettich.....Monadnock Bldg., S. F.
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., S. F.

ELEVATORS
Otis Elevator Company, Stockton and North Point, S. F.
Spencer Elevator Company, 126 Beale St., S. F.
S. F. Elevator Co.....860 Folsom St., S. F.
Van Emon Elevator Company, Natoma St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., 593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
Crosett & Eastman.....Hearst Bldg., S. F.
Hunter & Hudson.....Rialto Bldg., S. F.

EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices mfrd. by Vornegut Hardware Co. (see adv. for Coast Distributors).

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., 593 Market St., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vornegut Hardware Co. (see adv. for Coast Agencies).

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago. (See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., Head Bldg., S. F.
Gladding, McBean & Company, Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., L. A.
The Jackson Fireproof Partition Co. Levensaler-Spier Corporation, Distributors, Monadnock Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Company, 1157 Mission St., S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Moller & Schumann Co., 1022 Mission St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling. David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., S. F.

FORMS FOR CONCRETE
Metal form work, sold by California Sales & Supply Co.....San Diego

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit.
Bowser & Co. .....612 Howard St., S. F.

GARBAGE CHUTES
Bill & Jacobsen.....Rialto Bldg., S. F.

GLASS AND GLAZING
W. P. Fuller & Co., San Francisco, Los Angeles and Portland.

GRANITE
California Granite Co., 776 Monadnock Bldg., S. F.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.

WATER HEATERS - PUMPS
BOILERS

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SHREVE BLDG. SAN FRANCISCO

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ESTABLISHED 1886 — INCORPORATED 1913

Manufacturers of Structural Steel and Ornamental Iron Work

Office and Works: 31-37 Hawthorne St., bet. Howard and Folsom Sts., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

GRAVEL, SAND AND CRUSHED ROCK—Cont'd.
Grant Gravel Co.....87 Third St., S. F.
Niles Sand, Rock & Gravel Co.,
971 Howard St., S. F.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co.....S. F.
American Keen Cement Co, Levensaler-Spier Corporation, Representatives,
Monadnock Bldg., S. F.

HARDWARE
Pacific Hardware & Steel Co..S. F. and L. A.
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.

HARDWOOD FLOORING
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros.. Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

HARDWOOD LUMBER
Dieckmann Hardwood Co.,
Beach and Taylor Sts., S. F.
Parrott & Co.....320 California St., S. F.
Maria Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co.,
First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co.,
237 Powell St., S. F.

LOCKERS
Keyless Lock Co.,.....Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
Edward Stephenson..155 Fremont St., S. F.
C. A. Dunham Co., Marshalltown, Iowa. Western Division Office,
Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co.,
Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F
A. Lettich.....365 Fell St., S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
17th St., bet. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOSE RACKS AND REELS
Levensaler-Spier Corporation,
259 Monadnock Bldg., S. F.

HOTELS
The Angelus, Loomis Bros.....Los Angeles

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.

INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
418 Montgomery St., S. F.

INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa

INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co.,
155 New Montgomery St., S. F.

LIME
Holmes Lime Company,
Monadnock Bldg., S. F.
Henry Cowell Lime & Cement Co.,
9 Main St., S. F.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So.....Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (see adv. on page 38 for Coast representatives).

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co.,
Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co.,
Pacific Bldg., S. F.
Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors,
Monadnock Bldg., S. F.
John Roebling Sons Co., Folsom St., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
Pratt Building Material Co.,
Hearst Bldg., S. F.

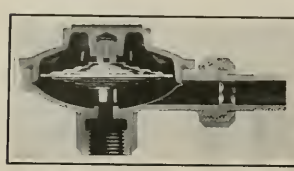
METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc.,
Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metallic Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.
Canton Mfg. Co., Sherman Kimball & Co.,
First and Howard Sts., S. F.

METAL FURNITURE
Dahlstrom Metallic Door Co., represented by M. G. West Co..353 Market St., S. F.
The Keyless Lock Co.....Indianapolis, Ind.
Van Dorn Iron Works Co.....Cleveland, O.
M. G. West Co.....353 Market St., S. F.
Chas. M. Finch,
311 Board of Trade Bldg., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.....220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co.,
275 Connecticut St., S. F.



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Makes Good on Every Essential Point, Send for Catalog

Western Division Office

C. A. DUNHAM CO. - 602-18 Monadnock Building

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CONCRETE FLOORS MADE { WEAR-PROOF / DUST-PROOF / WATER-PROOF } at 2¼c Per Sq. Ft. with **METALCRETE**

May we tell you more about it?
ALLEN M. OLINGER, Dist.,
With WATERHOUSE & PRICE, SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co., 349 Seventh St., S. F.
J. G. Braun.....Chicago and New York
Ralston Iron Works, 20th and Indiana Sts., S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., S. F.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.
Vulcan Iron Works.....S. F.

PAINTING AND DECORATING
D. Zelinsky.....564 Eddy St., S. F.

PAINT FOR BRIDGES
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Joseph Dixon Crucible Co., Coast branch, 155 Second St., S. F.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company. San Francisco and Los Angeles.

PAINT FOR CEMENT
American Paint & Dry Color Co., 560 Folsom St., S. F.
Bay State Brick and Cement Coating, ma by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfg. Co., ...Canton, O. See advertisement for Coast distributors

PAINTS, OILS, ETC.
American Paint & Dry Color Co. 560 Fulton St., S. F.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
R. N. Nason Company.....San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfg. Co., ...Canton, O. See advertisement for Coast distributors
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Standard Co.....268 Market St., S. F.
Moller & Schumann Co., 1022 Mission St., S F.

PAINTS, OILS, ETC.—Cont'd.
Berry Bros.....250 First St., S. F.
Paramue Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRAPHY
R. J. Waters Co.....717 Market St.,S. F.
Walter Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation.....259 Monadnock Bldg., S. F.
"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.
Herman Bosch.....4420 20th St., S. F.

PLUMBING
Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Coleman.....706 Ellis St., S. F.
J. M. Lettich.....Monadnock Bldg., S. F.
Antone Lettich.....365 Fell St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.....1001 Monadnock Bldg., S. F.
P. F. Howard Co..Folsom and 2d Sts., S. F.
California Steam Plumbing Supply Co., 671 Fifth St., S. F.
Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

POWER PLANT EQUIPMENT
F. Harvey Searight..817 Shreve Bldg, S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company.....San Francisco, Seattle, Portland and Los Angeles

RADIATORS
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.
Langford, Felts & Myers..Rialto Bldg., S. F.

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton, Sts., S. F.
Vulcan Iron Works.....S. F.

50 KINDS OF BUILDING MATERIALS
GOLDEN GATE BRICK CO.
660 MARKET ST. (opp. Palace Hotel) San Francisco. Phone Kearny 3378

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REVOLVING DOORS
American Revolving Door Co., 2514 Monroe St., Chicago, Ill.
Van Kennel doors, sold by U. S. Metal Products Co.....525 Market St., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F.

ROOFING AND ROOFING MATERIALS
Ames-Irwin Co., Inc., Eighth & Irwin Sts., S. F.
Biturine Co. of America, 24 California St., S. F.
F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co., Rialto Bldg., S. F
Golden Gate Brick Co..660 Market St., S. F.
Grant Gravel Co.....Williams Bldg., S. F.
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy, Monadnock Bldg., S. F.
Fibrestone & Roofing Co., 971 Howard St., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
Mackenzie Roof Co., 425 15th St., Oakland.
United Materials Co.... Balboa Bldg., S. F.

ROOFING TIN
American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.

RUBBER TILING AND MATTING
New York Belting & Packing Co., 129 First St., S. F.

SAFETY TREADS
Universal Safety Tread Co., represented by Waterhouse and Price, San Francisco and Oakland.
American Mason Safety Tread—See advertisement on page 131 for Coast Agents.

SANDSTONE BRICK
Sacramento Sandstone Brick Co., Sacramento, Cal.
Golden Gate Brick Co..660 Market St., S. F.

SANITARY DRINKING FOUNTAINS
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.....Monadnock Bldg., S. F.

SASH CORD
Puritan Sash Cord Company. (For Coast Agents, see advertisement.
Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines 88 Broad St., Boston, Mass.
Silver Lake A Sash Cord, represented by Sanford Plummer, 149 New Montgomery St., S. F.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Company. 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co....365 Market St., S. F.
512 S. Broadway, Los Angeles.

SHEATHING AND SOUND DEADENING
Neponset Waterproof Building Papers, Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK, SKYLIGHTS, ETC.
Berger Mfg. Co.....1120 Mission St., S. F.
Capitol Sheet Metal Works, 1927 Market St., S. F.
Yager Sheet Metal Co.....Oakland, Cal.
Western Furnace & Cornice Co., 1645 Howard St., S. F.
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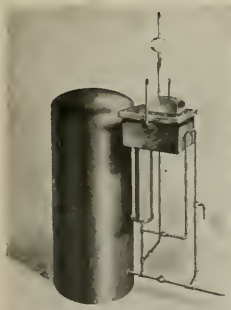

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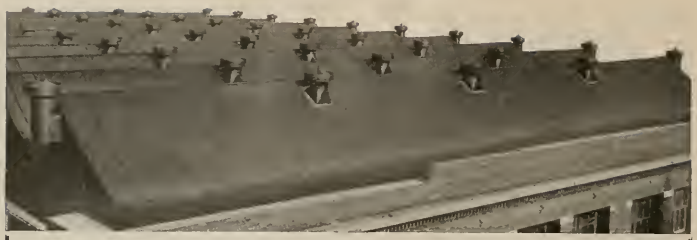

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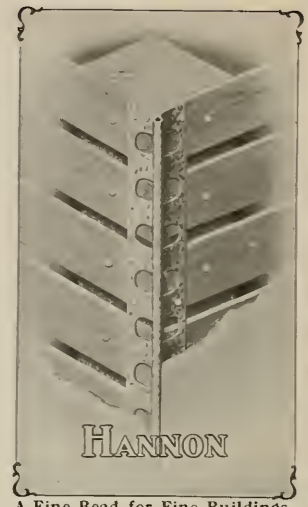

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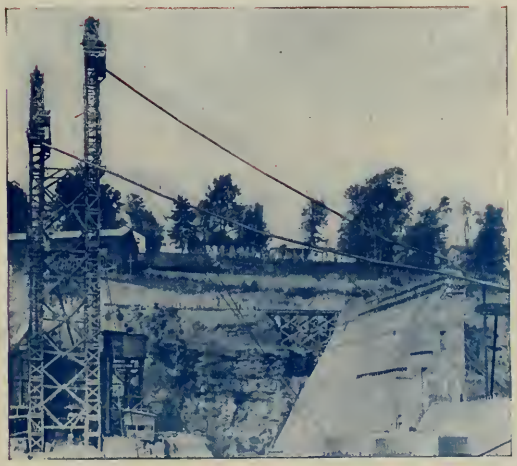

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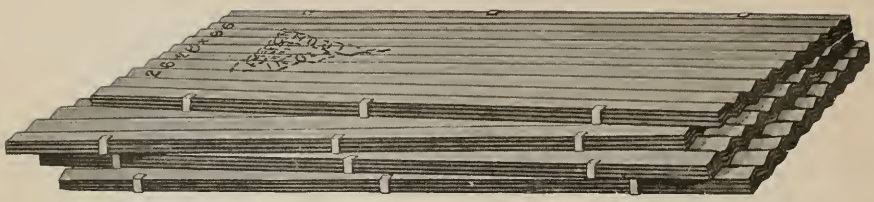

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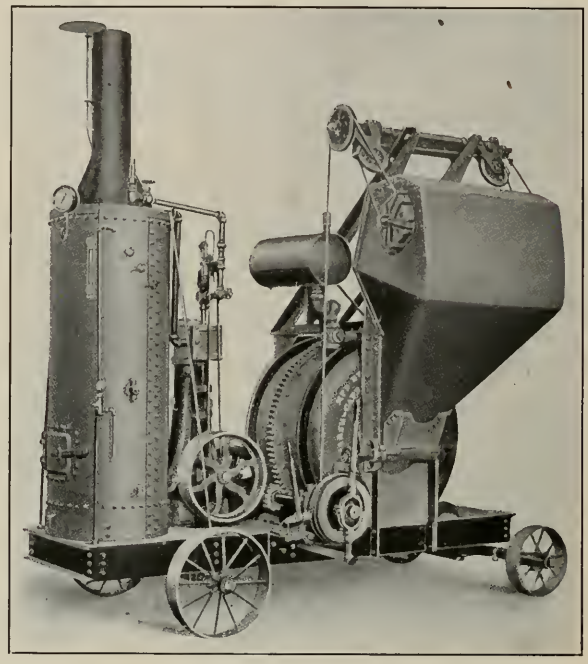

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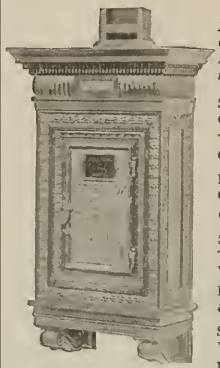

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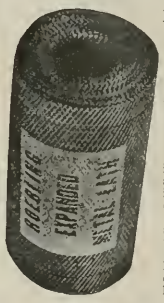

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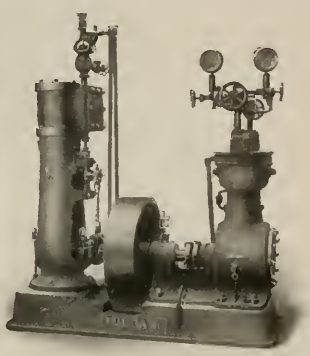

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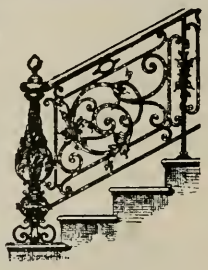

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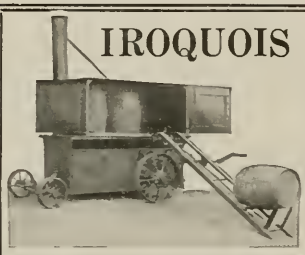

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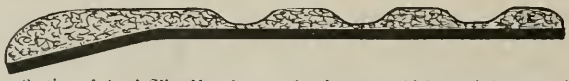

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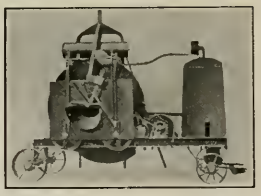

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Entered at San Francisco Post Office as Secood Class Matter.

Contents for November

	PAGE
Louis Christian Mullgardt, F. A. I. A.	*Frontispiece*
Who's Who in Pacific Coast Architecture. I—Louis C. Mullgardt	47
Recent Work of Mr. Clarence C. Cuff, Architect	49
Decoration in Architecture	58
W. P. Major, A. R. I. B. A.	
Eureka's New Bank Building	63
Albert Pissis, Architect	
Architecture and Dressmaking	66
The Decorative Value of Tile Flooring	67
A. B. Le Boutillier	
A Model Civic Center for the Woman's Republic Community, Atascadero	69
Bliss & Faville, Architects	
American Institute will Discuss Repeal of Tarsney Act at New Orleans Convention	75
Yearly Report of Publicity Committee, San Francisco Chapter, A. I. A.	77
Thos. J. Welsh	
Skyscrapers of Ancient Times	79
Estimate Hazards of Building Plans	80
J. M. Vollmer	
The Steel and Iron Industry of California	85
H. H. Morris	
Need of Honest Contractors	89
Plea for a Cement Show at the Panama-Pacific International Exposition	92
Charles E. Van Barneveld	
Concerning Water in Concrete Mixtures	97
School Competition Law of 1872 Declared Void	100
"Smoke-proof" Buildings	102
Some Foreign Sketches in Pencil and Wash	105
Among the Architects	111
Editorial	114
Municipal Engineering	116
Heating and Lighting	119
By the Way	126

(Index to Advertisements, page 8)

LOUIS CHRISTIAN MULLGARDT, F. A. I. A.
President San Francisco Society of Architects

Frontispiece
The Architect and Engineer
of California
November, 1913.

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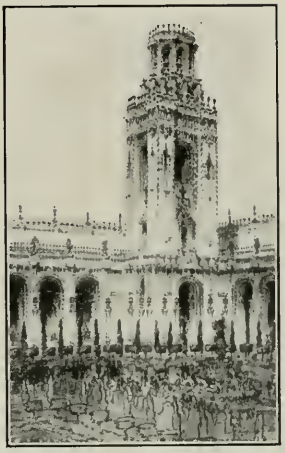
Who's Who in Pacific Coast Architecture

I.—Louis Christian Mullgardt.

LOUIS CHRISTIAN MULLGARDT, architect, of San Francisco, California, was born in Washington, Franklin County, Missouri.

Mr. Mullgardt's work is well known on both sides of the Atlantic. He received his preliminary education in public and private schools of his native town. In the summer of 1881 he went to St. Louis to study architecture in the offices of O. J. Wilhelmi, Ernest C. Janssen and James Stewart, well-known members of the profession. He also studied in the Polytechnic Institute and the Department of Fine Arts of Washington University.

In the winter of 1885 Mr. Mullgardt went to Boston, Massachusetts, as a student in the office of H. H. Richardson, Brookline, Massachusetts, and subsequently with Mr. Richardson's successors, Shepley, Rutan and Coolidge, of Boston. He also studied with Peabody & Stearns and Brigham & Spofford of Boston. During 1889 and 1890 he was a special student at Harvard University.



Echo Tower "Festal Court," Panama-Pacific International Exposition

With the training and experience gained during his student years, Mr. Mullgardt went to Chicago in 1891, and until 1893 was designer-in-chief in the offices of Henry Ives Cobb. Among the buildings designed in that capacity are the following: Newberry Library, Cook County Abstract Building, Chicago Athletic Association Building, University of Chicago and the Fisheries Building at the World's Columbian Exposition.

His exceptional talent and training placed Mr. Mullgardt among the few recognized leading architectural designers of the Middle West. In 1893 he returned to St. Louis to enter private practice. He continued there about nine years, having added to his reputation in designing and erecting numerous private and public structures. Among the more notable were the designs of the Abolitionist Monument to Elijah Parish Lovejoy, erected at Alton, Ill., by the State of Illinois; the University Club, St. Louis; Boyer Pneumatic Tool Factories at Detroit, Michigan, and St. Louis, Missouri, and the Arlington Hotel and Bath House, a stately group of buildings at Hot Springs, Arkansas.

In 1902 Mr. Mullgardt went to Manchester, England, respecting the construction of the New Midland Grand Hotel. In 1903 he went from Manchester to London and opened offices on Somerset street, where he engaged in planning the extensions of the celebrated Savoy Hotel on the Strand; also alterations on the old buildings of the Savoy on the Embankment. This is one of the historic hotels on the other side of the Atlantic, and Mr. Mullgardt's selection for this work—costing over $2,000,000—was a tribute alike to American architecture and to Mr. Mullgardt.

During the period covering his work on the Savoy Hotel, Mr. Mullgardt fulfilled other commissions in the British Isles. He remained in London until the year 1905, when illness at home necessitated return to the United States. Among the architectural works of Mr. Mullgardt in Great Britain were the designs for electric power stations for the British Westinghouse Company at Heysham harbor and at Neasden for the Metropolitan Underground Railway of London. He

Henry W. Taylor Residence in the Berkeley Hills

also designed a large factory for the British Consolidated Pneumatic Tool Company at Frazerburg, Scotland, and two electric power stations in the Clyde Valley, Scotland.

Mr. Mullgardt came to San Francisco in the spring of 1905, and has resided here and in Berkeley ever since. He entered private practice in San Francisco almost immediately and has been chiefly engaged in planning California country residences.

In 1912 Mr. Mullgardt was appointed member of the Architectural commission of the Panama-Pacific International Exposition and is engaged to design the "Festal Court," which will soon be under construction.

Mr. Mullgardt is a fellow member of the American Institute of Architects, Washington, D. C., and life member of the Harvard Engineers' Club. He is also a member of the Bohemian Club, the Sketch Club, the Olympic Club, and the Commonwealth Club of San Francisco, also honorary member of the San Francisco Press Club and of the Outdoor Art League. He is president of the San Francisco Society of Architects.

Mr. Mullgardt has been appointed by the executive officers of the American Institute of Architects in Washington, D. C., to the position of chairman of the National Architectural Exhibition Committee of the Department of Fine Arts of the Panama-Pacific International Exposition.

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"An Architect"

IN THE October number of Buildings and Building Management there appears an article on "Tall Buildings in Smaller Cities as Investments," by William C. Lengel, which should offer some interesting facts for the consideration of both architects and investors.

It is not our purpose, however, to deal with the questions of economic interest involved, nor to hold any brief for the architect who designed the building under consideration, which, "like a gigantic dry-goods box placed on end, stands at the intersection of the two principal streets of ————." We cannot dissent from the opinion that the failure of the building to pay might well be charged to bad planning. What we should like to point out, however, is the element of unfairness which is easily woven into the writer's statement that at the beginning of the operations the owner called in "an architect." The phrase seems to carry the same stigma that the man in the street means to convey when, after a disagreeable experience, he refers sarcastically to "a plumber," or "a doctor," or "a banker." It seems to be a universal method of castigating a whole profession, or calling, for the mistakes of one of its members. We should much prefer to learn that the owner called in "an incompetent architect," or that a man had dealt with "a dishonest plumber," or "an ignorant doctor," or "an untrustworthy banker."

All of these things are in existence—there are men practicing architecture who are totally incompetent; but as this is a matter of almost common knowledge, the remedy lies in the choosing of the man—not in accepting incompetency and dishonesty as universal.

We do not believe that Mr. Lengel meant to imply the wholesale incompetence of architects, and we feel sure that a succeeding article will illustrate what a competent architect can really do for a client in the matter of plan and design. The examples are surely sufficiently numerous—Journal of the American Institute of Architects.

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XXXV. NOVEMBER, 1913. No. 1.

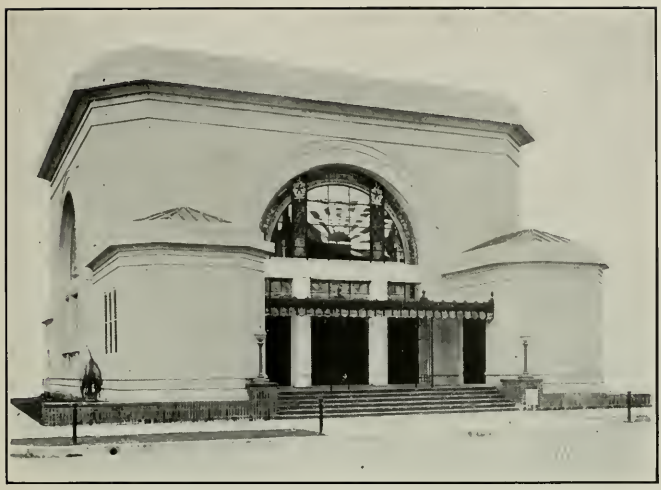
Recent Work of Mr. Clarence C. Cuff, Architect

Merriam Apartments

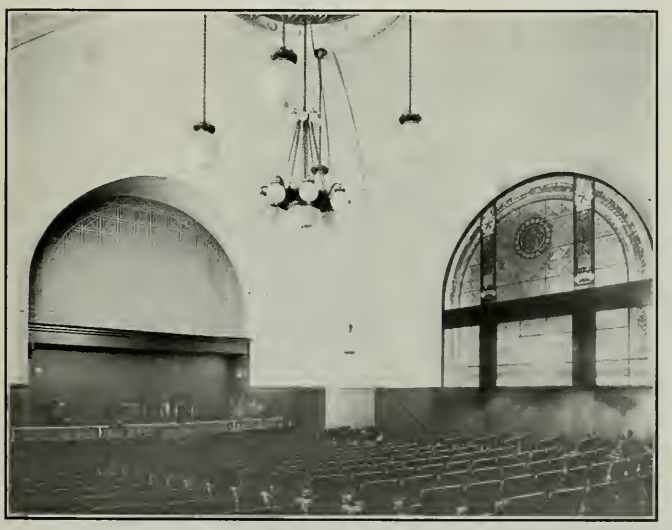
SOME of the work done by Mr. Clarence C. Cuff, architect, of Sacramento, is shown in this issue of the Architect and Engineer. It covers a wide range of architectural effort, beginning with the modest home and ending with the pretentious skyscraper. The work affords a very positive indication of the tremendous strides Sacramento has been taking in building development during the last five or six years. The residence designs bespeak the refinement and thriftiness of the owners. The type of architecture is in harmony with the California climate and environment—the plaster exterior treatment predominating. Mr. Cuff enjoys the enviable distinction of being the first architect in Sacramento to design a building of ten stories or more. His study for a twenty-story skyscraper—the erection of which is practically assured—is shown in the accompanying plates. He has worked out a plan that is both dignified and practical and that will compare favorably with the best bank and office buildings in the country. Mr. Cuff's design of the First Church of Christ, Scientist, is deserving of mention, as it indicates an appreciation of the later-day type of ecclesiastical architecture.

What may be called Mr. Cuff's hobby is his plan for an Exposition Building and Convention Hall to be erected in the Capital City, with the idea of providing a convenient headquarters for the architect, manufacturer and building-material man—a place where the architect can view the agent's multiplicity of devices—new and old—used in construction work, and a place where the manufacturer's agent can get an audience with the architect, builder and owner and explain the merits of his goods. Literature may be given out as the architect calls for it, and it need not be necessary to flood his offices with samples and second-class mail matter that invariably find their way into the waste basket. Besides the exhibition hall, the building will contain a large lecture room or convention hall, having a seating capacity of 3,000. This hall will be for political meetings, conventions, musicals, flower, poultry, cat and dog shows, benefits, fairs, etc., and it is estimated will bring between 300,000 and 400,000 people through the exhibition hall each year. It is proposed to have the Architectural Club rooms on the top floor of the building. Construction will be fireproof.

Design for Twenty-Story Bank and Office Building, Sacramento
Exterior to be Finished in Sacromento Sandstone Brick
Clarence C. Cuff, Architect



First Church of Christ, Scientist, Sacramento
Clarence C. Cuff, Architect



Interior First Church of Christ, Scientist, Sacramento
Clarence C. Cuff, Architect

White Hospital, Sacramento
Clarence C. Cuff, Architect

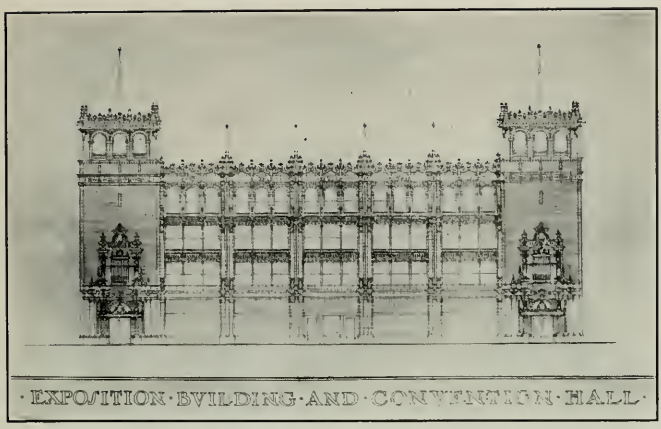
Theater Diepenbrock, Sacramento
Clarence C. Cuff, Architect

Fireproof Warehouse for Sacramento Warehouse Company
Clarence C. Cuff, Architect

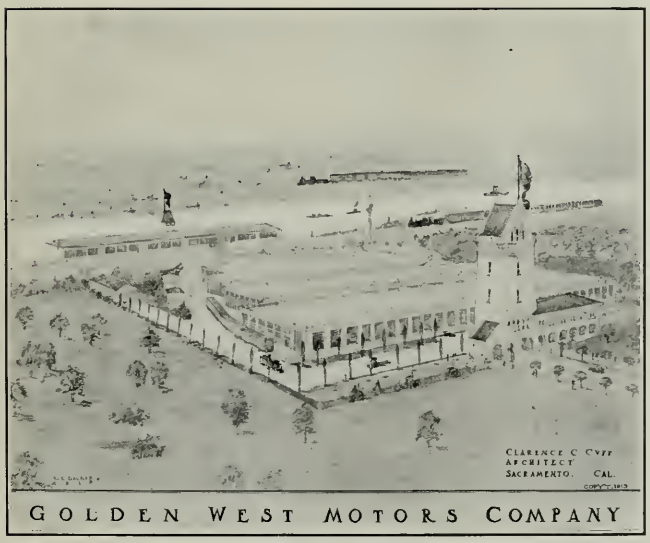
Reinforced Concrete Warehouse for the Thomson-Diggs Company, Sacramento
Clarence C. Cuff, Architect

El Dorado County Court House, Placerville, California
Clarence C. Cuff, Architect

Detail of Entrance, El Dorado County Court House, Placerville, California
Clarence C. Cuff, Architect



Design for Exposition Building and Convention Hall, Sacramento
Clarence C. Cuff, Architect



Residence of Mr. C. L. Nelson, Woodland, Yolo County, California
Clarence C. Cuff, Architect

House of Mr. D. W. Carmichael, Sacramento
Clarence C. Cuff, Architect

House of Senator Marshall Diggs, Sacramento
Clarence C. Cuff, Architect

House of Mr. C. B. Dewees, Sacramento
Clarence C. Cuff, Architect

Decoration in Architecture*

By W. P. MAJOR, A.R.I.B.A.

MR. PRESIDENT AND GENTLEMEN:—It is at your request I am compelled to read a paper to you tonight, and therefore I have no apology to make if what I have to say lacks interest. You have chosen and now you must suffer the consequences of your choice. It is my intention to lay before you some of my thoughts in regard to designing the decorative and artistic side of architecture in the hope that some of you at least may not entirely agree at the outset with what I have to say and that we may have some discussion from which benefit may be derived. I might entitle my paper Decoration in Architecture, and divide it under two principal heads, Decorated Construction and Constructed Decoration. Later I intend to suggest a third and one which, I think, you will agree with me applies more nearly to the methods of decoration which are, or perhaps rather should be, adopted in these days. Decorated Construction is, as we are all no doubt aware, most adequately exemplified in the style of architecture we call Gothic, and there is scarcely a feature of this style in its pure form that is not Construction Decorated—the pillars, arches, groined ceilings, windows, wonderful tracery, buttresses, pinnacles, parapets and beautiful ornamental wooden roofs, all of them necessary to the stability and purpose of the structure, and yet beautiful examples of decorative art.

The Greeks, too, undoubtedly decorated their construction, and in doing so tended to give to their construction the appearance of even greater stability, for example the entasis to the columns and other means adopted to correct optical delusions. In other words, they realized that it was essential that their buildings should appear structurally correct in order that they might appear beautiful. So that whether we turn to Classic or Gothic architecture we find the best examples of either style to be Construction Decorated.

These two styles are the foundation of the architecture of the present day, and one would therefore naturally expect the vital principles of those styles to be carefully followed. Is this so as regards decoration? As we turn to the architecture of the present day what a very different aspect it presents to us, and how glaring are many of its faults! How frequently as one walks down the streets of any city on this continent can one see a moulded beam perhaps two feet or even three feet deep, made to represent a monolith of sandstone, spanning a distance of twenty-five feet or more and resting on piers at either end 18 inches to 30 inches wide, composed of similar material or of brick; then piled on top of this beam is a mass of stone, brick, terra cotta or similar material 20 to 100 feet high which this stone beam is evidently intended to appear to support. How signally the intended effect fails is apparent to all of us, and yet we go on repeating this same obvious mistake day after day, year after year. Then consider the supporting piers. How absurdly small they are for all the tremendous weight that they appear to have to uphold.

Take again that favorite abortion of some of us which we see only too frequently. I mean a row of bricks on edge across an opening with 10 or 20 feet of brickwork above it. We know, and even the most uneducated readily realize, that by the simple laws of nature it should fall

*Paper read before the Calgary Chapter of the Alberta Association of Architects, September 9th, 1912.

to the ground without any mass of brickwork above it to help push it down.

Then we see the brickwork just continued straight across an opening which renders the result more deplorable than ever, and without doubt those people who have no knowledge of construction at all must sometimes wonder how the bricks or terra cotta stay in place, and possibly sometimes say to themselves what wonderful mortar must have been used in that building. The next glaring misuse of decorative features that comes to mind is the use of a wide span segmental arch frequently of brickwork with abutments of a very slender nature. Sometimes you can see this feature high up in a business block, sometimes at second-floor level, also in dwellings and any and every kind of building, and if one did not know the secrets of the construction it would be a matter for amazement how ever the structure held together, and we should be wagering on the hour of the day at which it would fall. One can hardly omit mentioning the method sometimes adopted—more especially over a store front—of decorating the upper stories of a building with a series of brick or stone pilasters which the convenience of the designer has prompted him to place anywhere but directly over the piers on the lower story. The effect given is necessarily that the pilasters are by some sticky method attached to the walls instead of appearing to be the main points of support. There are many other instances of a similar nature far too numerous to mention in a short paper like this, where decorative features which should represent to the eye at least support and stability and give to the senses a feeling of restfulness fail in their purpose because of the lack of truth in their application. I think we may rightly determine these things to be a failure on the part of the architect to solve the problem of his elevation, and it may not be inappropriate to mention here that if the architect who is a scientifically trained man in the design of architectural decoration frequently fails in the complete solving of the problems put before him, how can the man who has had no architectural training expect to find that his design when executed consists of a jumble of badly imitated features and grotesque detail? And yet we find civic authorities continuing to allow at least the small civic buildings to be designed by all sorts and conditions of self-styled artists, with the result that the building that was intended to beautify a park, square or civic center is not only a cause for dissatisfaction in itself, but has a soiling effect on its entire surroundings.

But to resume from this diversion. I want to make it clear that the failures, some of which I have mentioned, are not confined to any particular grade of architects, if there are grades, but are faults of which we are all capable and culpable. Unfortunately, I am not doctor enough or clever enough to be able to point out the remedy for all these faults; I leave that for the individual to discover, but I do think that with more study of the problems in design before us we can eliminate some of the more glaring instances of incorrect application of decorative features. We can certainly eliminate some, such as the brick-on-edge arch, by discontinuing their use.

In designing the decorative part of a building it is necessary to adhere most faithfully to the natural expression of the material in which we are working. For instance, if we build the top story of a building in granite and the lower stories in brick the effect is that the lower portion is not strong enough to support the top. Why? Because granite by its appear-

ance imparts to the mind a sense of great strength and weight, whereas brickwork naturally appears to be a much lighter and weaker material, and therefore by their natural expressions the granite should be placed at the lower story and should support the brickwork. Oh, but you say this is a ridiculous instance. You can pick up your Construction and see there, as I have done many times, a photograph of a brick and stone building with the top story executed in sandstone with wide joints, the wide joints being evidently put in to add to the effectiveness of the drawing, whereas in execution they give weightiness and strength to the appearance of the stonework, which necessarily appears to be crushing the brickwork below. There are plenty of other similar instances to be found, and one does not have to look far afield.

No doubt in many of them the walls and facing material are supported on a steel frame, and therefore the building is not affected structurally, but should we not characterize a man as foolish if in building solid constructional walls he put his brickwork on the lowest story and his granite or stonework on the top story? And that being so, are we not equally foolish when we try to decorate a building by reversing the order of materials?

Let us always remember that each material has an expression entirely its own, and is naturally suited to fill certain positions in a building, and fulfill certain requirements. If, then, its characteristics are not considered in the design it will invariably appear to be out of place when the design is executed. How, for instance, can we expect to make a plaster arch appear to support several stories of brickwork? And yet we see it attempted. It may do it on a drawing. Plaster is obviously suited to positions in a building where it fills no structural capacity, but is merely a protection from the elements and is, therefore, suitable for panels and similar positions.

Possibly by now you may have the clue to my third heading which I spoke of in the beginning. Decorated Construction, we know by beautiful examples of an ancient past. Constructed Decoration we know from a near past, and my hope is that in the near present, if we cannot solve over again the problems of Decorated Construction in our day, we may adhere in our designs most faithfully to what I term Decorative Construction. This is more distinct from Constructed Decoration than at first appears, inasmuch as the latter is not always decorative; in fact, far too seldom is it so. You will readily acknowledge of the truth of what I say and no doubt you have already some piece of decoration in your mind which rather than describe it as being decorative you would call it disfigurative. The distinction of the term then being acknowledged, I will proceed with an outline of my interpretation of its meaning, and I think the first rule it would spell out to us is the true and faithful use of materials according to the characteristics with which nature has endowed them. This I have already spoken of and there is not space for enlargement in a short paper.

The second rule, which is only second because there cannot be two firsts, is that the different features of the elevation should be so designed that they appear to be carrying out their entire function in helping to uphold the building of which they are a part. It may not be practicable to design the beam I spoke of before so deep that if it were composed of a monolith of sandstone it would withstand the stress of all the weight appearing to rest upon it, but it is possible even under modern conditions to increase its depth considerably from that usually in practice and by careful designing eliminate to a great extent the appearance of the weight of the superstructure. Or why should it not be treated in high buildings so that it occupies the space of a whole story

and thus obtain sufficient depth to counteract the weight above? These are only suggestions and there may be other means which some of us can devise to gain a satisfactory result.

Then, in regard to the cap of the piers, how obviously out of place is a Corinthian or Ionic cap on the lowest story where there is great weight above. The situation calls for a cap which is sturdy and strong in appearance, a cap which appears to be doing its work. Piers obviously should line exactly over those below and thereby appear to transmit directly the weight of the various stories above. A series of segmental arches may in a building on an inside lot find additional abutment in the adjoining building and when on a corner lot abutment can be obtained usually by planning the two end piers closer together and using a semi-circular arch between them. If this end feature is carried up through the height of the building as a sort of tower it will by its superincumbent weight appear a stouter abutment. Mouldings play an important part in the elevation and it is essential that they be designed to fit the particular position they are intended for. The third rule would apply to sculpture and carving, and it is very necessary to remember that these things have their proper place in a façade. It is a fallacy to imagine that a building can be made beautiful by covering the façade with carving and sculpture, as we sometimes see done. We are fortunately spared that danger in this city, as the cost of such work prohibits a prolific use of it. Perhaps the keynote of all these things is to be sounded in two words, proportion and unity.

Proportion is everything and Unity of part with part should prevail so that nothing looks out of place. All the individual features of the facade should fit in together to form a complete whole. And above all let our buildings be constructive in their design. It is a comparatively easy matter to make a badly designed building look fairly decent on paper by putting in a few brick lines and some shading, but when the design is executed it is then that the main lines of the elevation tell their tale, the weakness of a pier shows up and the moulding, which was hidden on the drawing by a multiple of lines, stands out in all the nakedness of its horrible proportions. But I do not want to speak of proportion tonight —that deserves a paper to itself. I only mention it because it is essential in the fitness of things, and this paper is upon the fitness of features to the position that they occupy in the façade of a building. Architects in these days have to construct their decoration, but if we would conscientiously do so as nearly as possible along the lines of Decorative Construction our buildings would undoubtedly show a vast improvement in architectural quality. This is a steel age—our buildings are erected in steel and reinforced concrete. Why cannot we design our elevations in the same material, decorating our construction? That, I think, is the real problem before us, and I would suggest that if those clever Greek artists or those wonderful Gothic architects had lived in these times they would surely have found some means of decorating the buildings of these days in the material of which they are constructed.

Possibly if we had not the examples of the past to draw upon and if those examples were not drummed into our heads by every possible means education can employ—if we could in a word obliterate all that has gone before, forget our stone, terra cotta and brick, we naturally might develop steel construction to a thing of beauty, but under the conditions which rule in these days we are permitted no developing process of that kind.

The architect who is bold enough to ornament the construction of a steel-frame building has to first have a fully developed and thought-out design and has to stake his reputation on that design, which will be compared with

the best buildings in the usual materials, and he has moreover to contend with the taste of the public, who have become naturalized to buildings of stone, terra cotta and brick. That is enough to frighten any man away from that kind of originality unless he is independent enough and rich enough to test his ideas in a building of his own. Let me give an outline suggestion of what might be done. There would in the first place have to be some method of treating steel to eliminate the action of weather, but we will suppose this done. Imagine the steel columns, each carried up in one long continuous panel with ornamental steel brackets at the floor joists to support the horizontal girders, which could be suitably moulded, the panels filled in with copper or some metal, or even brick, terra cotta, stone or plaster, the windows of metal and the whole building crowned with an ornamental iron cornice, not cast in the forms we are so familiar with, but executed in a design suitable to the material, say for instance, along the lines of the designs for theater canopies, though, of course, not with the same amount of projection. The store front would be a simple matter to deal with in metal or glass, and the space below the window could be carried out in metal, marble or some other suitable material. The entrance would readily adapt itself to being designed in ornamental steel, copper or iron, and thereby a maximum amount of light could be obtained to light the interior hall or lobby. In fact, the whole design would readily lend itself to the uses of man inasmuch as the maximum amount of light could be obtained. The difficulty is to make the exterior appearance of the building such that it would be a pleasure to look at, both from the view of the public and that of the trained architect. The interior of the buildings could still be decorated with imitations of a past art or possibly some original and progressive method of decoration could be devised.

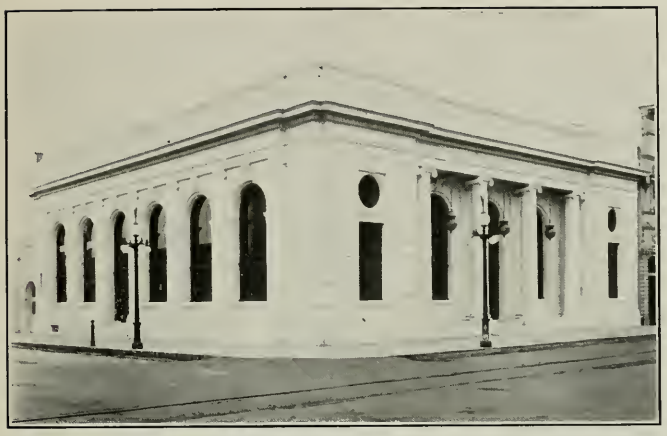
This is architecturally an age of adapting the highly developed arts of the past to our present needs, and in many cases merely copying and imitating them, often bad imitations at that. You will readily acknowledge that the Greeks developed classical art to its highest pinnacle and it seems to me that ancient Greece would tell us that we are endeavoring to apply an art to our ten-story buildings which they found only applicable to one story. Surely the steel buildings of today cry out for some radical change in design, some radical change in the principles of design, some change in the principles of proportion, for it seems to me that the eye does not demand that the principles of proportion adopted for classical columns should be repeated in a steel stanchion.

I believe that a change of this nature must inevitably take place sooner or later, and when it does we shall be once more carrying out the principles of Decorated Construction. Let our thoughts be directed towards this end and in the meantime, as we can do no better, let us do no worse than carry out in our designs the principles of Decorative Construction as far as is possible under modern conditions.

* * *

Notable Numbers for 1914

One of the treats in store for Architect and Engineer readers in 1914 will be an issue devoted entirely to the work of Messrs. Bliss & Faville, of San Francisco, architects of the $1,000,000 Masonic Temple, the Bank of California, the Oakland Hotel and other notable structures. An issue is also being prepared for Architect Louis C. Mullgardt, and in this number details and working drawings of Mr. Mullgardt's Panama-Pacific Exposition plans will be shown.



The Bank of Eureka and the Savings Bank of Humboldt County
Albert Pissis, Architect

Eureka's New Bank Building

THE accompanying plates show a splendid example of the classic bank building of the individual type of construction, now so popular with financial institutions which prefer a building exclusively for banking purposes. The structure was designed by Architect Albert Pissis of San Francisco for the Bank of Eureka and the Savings Bank of Humboldt County. The building is Class A with steel frame and stone exterior.

The ceiling of the main banking room is twenty-four feet high, which, with the imposing exterior, lends character and dignity to the institution.

The entrance to the main banking room opens directly from one of Eureka's principal thoroughfares, and affords the public an immediate view of the various departments.

The color arrangement and simplicity of style combine to render the interior decorations exceedingly attractive, and in perfect harmony.

The main bank floor, by its generous width and length, makes it possible to break up the long waiting lines at the various windows. A large skylight illuminates the whole interior of the banking room, which, with its lofty ceiling, its trimmings of Columbia marble, bronze and mahogany, makes a pleasing impression.

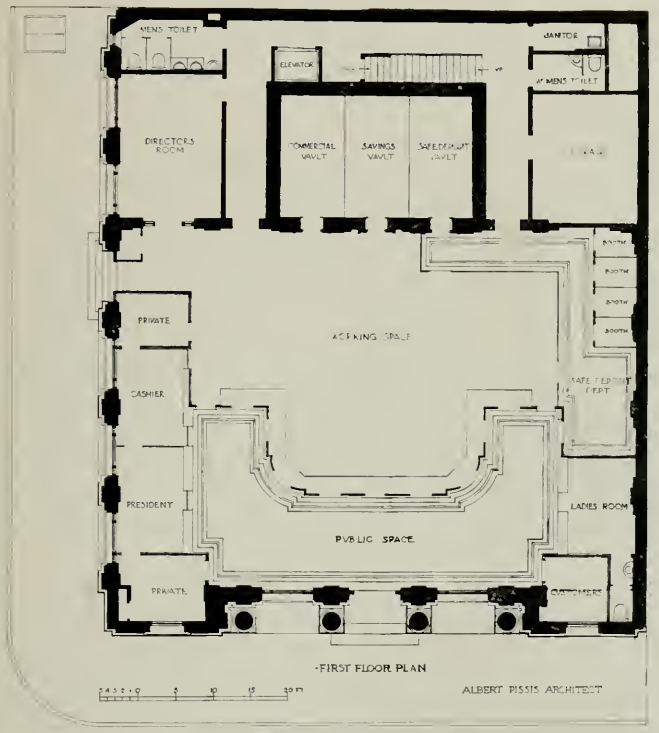
For the convenience of ladies visiting the bank, a special room has been provided, which is tastefully furnished with chairs and writing desk for their exclusive use.

There are contained in the four vaults 75,870 pounds, or about 37 tons of steel. The first-floor vault is divided into three separate departments, each having its own entrance, and being known as the Commercial, Savings and Safe Deposit vaults. Another large vault on the mezzanine floor, which is a part of the main vault, and the same size, is to be used for storage purposes.

The vault walls are 21 inches thick, of which 18 inches is concrete, reinforced by half-inch square corrugated steel bars placed in horizontal and verti-

Detail of Entrance, the Bank of Eureka and the Savings Bank of Humboldt County
Albert Pissis, Architect

Interior Bank of Eureka
Albert Pissis, Architect



Ground-Floor Plan, Bank of Eureka
Albert Pissis, Architect

cal positions, both on the inside and outside of the walls, one inch from the surface, the inside staggered with the outside. Each vault is lined with quarter-inch Bessemer steel plates. Between this lining and the concrete walls is a 2½-inch air space to take up any possible heat from fire.

The vault doors, each weighing 3,500 pounds, are built up of chrome steel and drill-proof. There are twenty bolts 1¼ inches in diameter in each door, and these bolts are checked by four-tumbler latest improved Yale combination locks. Behind the steel grilles within the vaults are the coin safes and safe deposit boxes.

The popularity of safe deposit vaults for the keeping of valuable papers, jewelry, etc., has greatly increased in the last few years. The proven strength of these structures, defying earthquake and fire, as shown in the San Francisco disaster a few years ago, has brought them into public notice and favor, and it is now one of the recognized functions of a bank to provide its patrons with such facilities.

Interior Bank of Eureka
Albert Pissis, Architect

Architecture and Dressmaking

"IT HAS seemed to me after thirty years or more of observation, that styles in architecture and styles in women's dresses go pretty much hand in hand. When women's costumes are elaborately decorated with flounces and furbelows, and women bedeck themselves with flowers and patterns, the influence on architecture is very apt to be noticed, and on the other hand, when simple, plain lines are adopted by the women it is again noticeable in the general design of buildings."

This rather startling assertion was made the other day by C. H. Frost, president of the Los Angeles Pressed Brick Co., in the course of relating reminiscences of his early experience in the clay industry. In the seventies Mr. Frost was the head of a large brick company in Chicago and furnished the brick for a number of structures planned by the late D. H. Burnham. Among these was the Rookery Building, then a "skyscraper," although only eleven stories in height. In the Rookery Building Mr. Burnham used a new style of brick, of which about 45,000 brick were required—a large order in those days. In following the development of brickmaking Mr. Frost asserted he saw a reflection of the prevailing severity or elaborateness of decoration of women's dress in the demands of the architects on the brickmakers.

If this rule always holds, asks the Southwest Contractor, are we soon to see the hobbled building or the transparent one—made of glass, for instance—as the new departure in design to conform with modern dress styles? Who will be the first to work out the slit doorway? Have you noticed any relation between a general use of the wide cornice and the big flapping hat? How about the modern flag pole—will it be topped, not with the usual small ball, but by a waving plume—and set on the front or the rear of the building?

The Decorative Value of Tile Flooring

By A. B. LeBOUTILLIER in The Contract Record

TILE floors have a practical value; they also have great decorative value, and it is with the latter that we are at present concerned. Owing to the peculiar limitations of the material and the methods of manufacture, tiles are necessarily small units. To cover a large surface with these units, obviously requires numerous joints. Therefore, the joints, as well as the tiles, should be given importance in the design. From a designer's point of view, the limitations of a material are its greatest asset, each material requiring its own peculiar treatment.

Not many years ago, all the tiles that were available for floors were of the machine-made variety, so perfect in workmanship that they could be laid in a floor with joints of a hair's breadth. These tiles were made in a variety of shapes and colors, but it was useless to lay out a pattern in one color, because the pattern of the joints could not be discovered without close inspection. If pattern was to count, it was necessary to use color, and the effect was generally hard, dry, and uninteresting. Conditions have since changed, and we have come to realize the value of the joints. It is seldom necessary to lay a floor of plain tiles with joints less than one-quarter of an inch in width. Whether these joints are left the natural color of cement, or are colored, they will always count in the design, and the slight unevenness of the tiles themselves will give a texture that is not as hard and uninteresting as the floors of mechanical perfection.

The character of the building and the location of furniture and rugs affect the design of the floor. If the floor is in an important room of a monumental building and is free from large pieces of furniture, it may well be treated so as to be in accord with the architectural treatment of the walls, but if there is to be much furniture and many rugs on the floor it is better treated as a whole. This is a point that is often lost sight of in railway waiting rooms and restaurants.

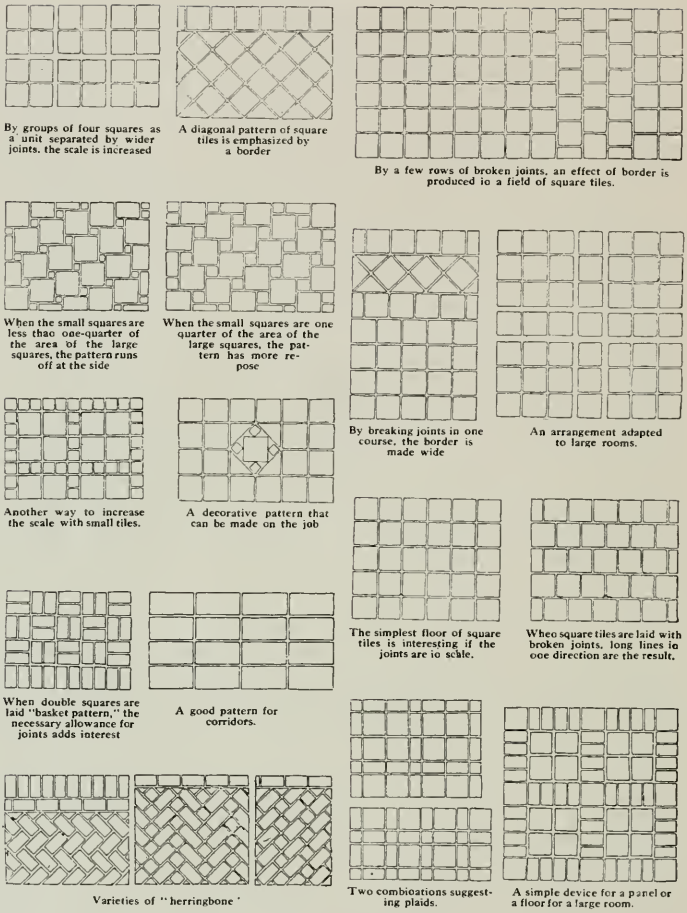
Church floors afford as great an opportunity for tile work as the windows do for stained glass. Much could be said on this subject alone, but it is sufficient here to make the following observation: The nave aisles should be simple, the choir somewhat more elaborate, and the sanctuary very rich in pattern, symbols and color. In short, the elaboration increases as the altar is approached.

It is not necessary to use large tiles in a large room to get scale, as the tiles can be arranged so that the unit is composed of several small tiles, and the scale of the pattern increased or reduced at will.

It is not essential that all the tiles laid in a floor come from one factory. Herein has the tile setter great advantage, especially in colored tiles. In the matter of shapes and designs, clay is so easily moulded that there is almost no limit to the variety that the smallest factory can produce. It is in the matter of glazes and quality that manufacturers differ.

There are many patterns that have been common property ever since the beginning of tile making, and are to be found, with slight variations, in many tile manufacturers' lists. New designs can be readily produced and old ones revived; the process is simply a model in clay or wax, from which a plaster mould is made, then the clay pressed in by hand, removed from the mould, dried and baked; a simple primitive process, to which tiles owe much of their charm. The difficulties are in composition of the clay and glazes; these, of course, it is assumed, have been overcome by the manufacturer.

The ideal method of designing a floor is to arrange a general scheme and then lay out the details on the job, changing and rearranging details as occasion arises. This, of course, requires an artist as a workman—and there are such

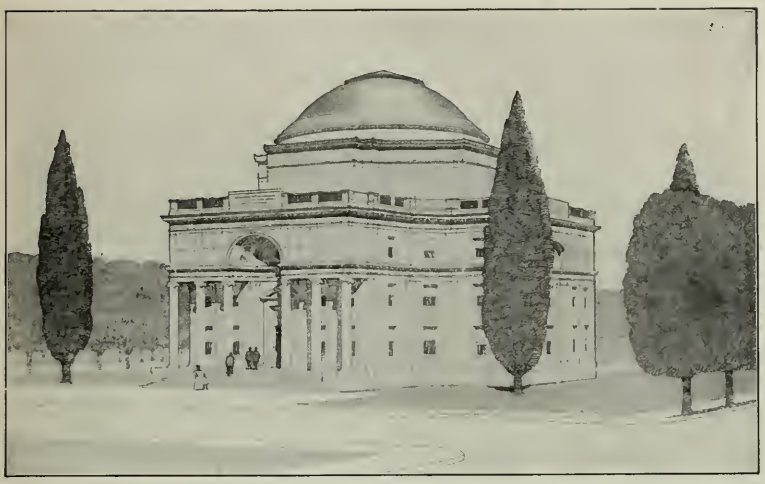

By groups of four squares as a unit separated by wider joints, the scale is increased
A diagonal pattern of square tiles is emphasized by a border
By a few rows of broken joints, an effect of border is produced in a field of square tiles.
When the small squares are less than one-quarter of the area of the large squares, the pattern runs off at the side
When the small squares are one quarter of the area of the large squares, the pattern has more repose
By breaking joints in one course, the border is made wide
An arrangement adapted to large rooms.
Another way to increase the scale with small tiles.
A decorative pattern that can be made on the job
The simplest floor of square tiles is interesting if the joints are in scale.
When square tiles are laid with broken joints, long lines in one direction are the result.
When double squares are laid "basket pattern," the necessary allowance for joints adds interest
A good pattern for corridors.
Varieties of "herringbone"
Two combinations suggesting plaids.
A simple device for a panel or a floor for a large room.

Some Suggestions for Tile Flooring

—or constant supervision. This is not always possible, but when it is done, the result is spontaneous, and free from the mechanical look that might come from a hard and fast plan laid out on the drawing board.

By the use of color in pattern, and pattern in individual tiles, there is almost no limit to the richness and elaboration possible for tile floors, but on the other hand, it is also possible to make an interesting floor of plain tiles in one color by taking advantage of the joints.

The diagrams will serve as reminders that the joints are of equal importance with the tiles.



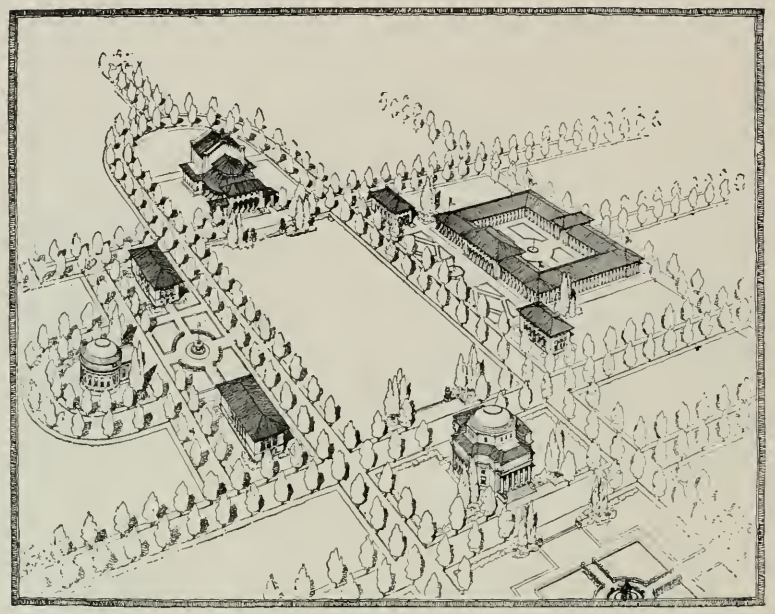
Administration Building, Civic Center, Atascadero, California
Bliss & Faville, Architects

A Model Civic Center for the Woman's Republic Community, Atascadero

THE design of a Civic Center for the "Communities Foundation" of the Woman's Republic at Atascadero, San Luis Obispo county, California, which is reproduced here, has met with the most favorable criticism by architects, and will undoubtedly be one of the model civic centers of the world when completed. The individual buildings, all carried out in the Italian, including both the administration building and the building of the Woman's Republic, with their white walls and red tile roofs, form a superb contrast with the brilliant coloring of the flowers and foliage of the region. The Civic Center, easily accessible from all parts of the colony, will be the center of the social, educational, and business life of the community, as well as the seat of its government and of its university and school system.

Messrs. Bliss & Faville, the architects, chose the pure Italian school of architecture as best adapted to the brilliant coloring of the native flowers, shrubs and foliage, and the clear southern sunlight. The construction of all the buildings is to be fire-proof, and hollow tiling will probably be used for floors and partitions.

Just below the eastern end of the Civic Center Atascadero creek crosses the valley and will form the dividing line between the two cities. On its opposite side, stretching down the remaining half of the valley, will be the Industrial City, with the new railroad station at the new location of Atascadero on the main line of the Southern Pacific railroad, where it crosses the lower end of the valley. Connecting the two cities will be a

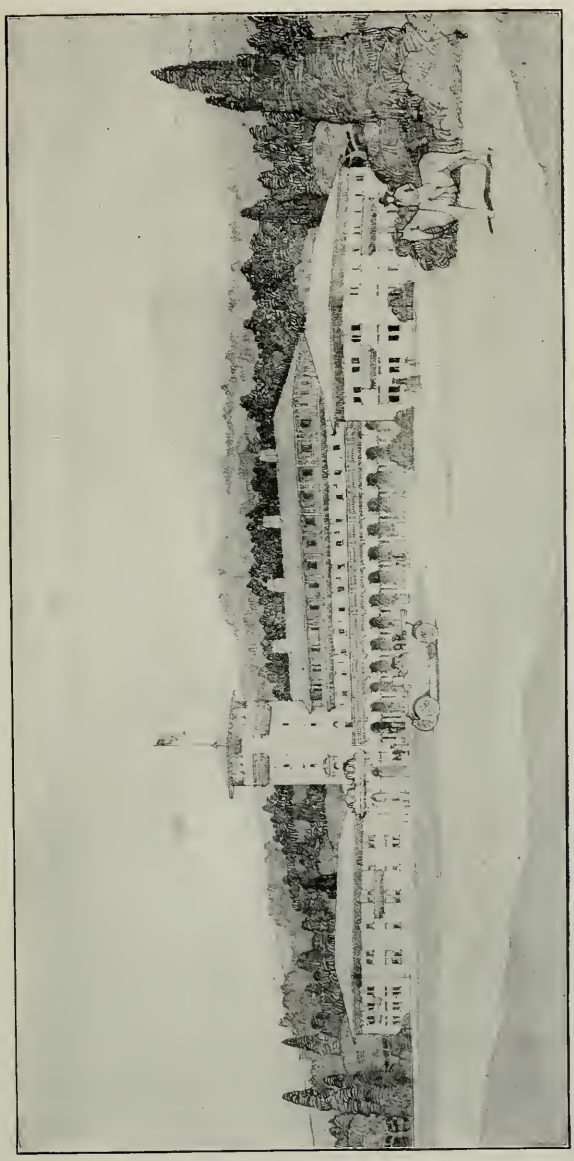


Plan of Civic Center, Woman's Republic, Atascadero, California
Bliss & Faville, Architects

broad boulevard, running from the depot straight through the two towns to its juncture with the state highway, where handsome entrance gates to the Civic Center will be erected.

Probably the great department store will have as large, if not larger, interest attached to it than almost any other building of the group. Built in the shape of a quadrangle with a central court or patio of flower gardens, it will embrace under a single roof all the stores of the community, together with rest rooms, lunch rooms and the most complete equipment. As it will be the center of the merchandising of from fifteen to twenty-thousand people, residents in the community, many of them of considerable wealth, this store will rival those of the largest cities in the completeness and desirability of its stock. It will be especially designed to meet every requirement of the community, and to give a service to all parts of the community that will equal that of the finest metropolitan stores.

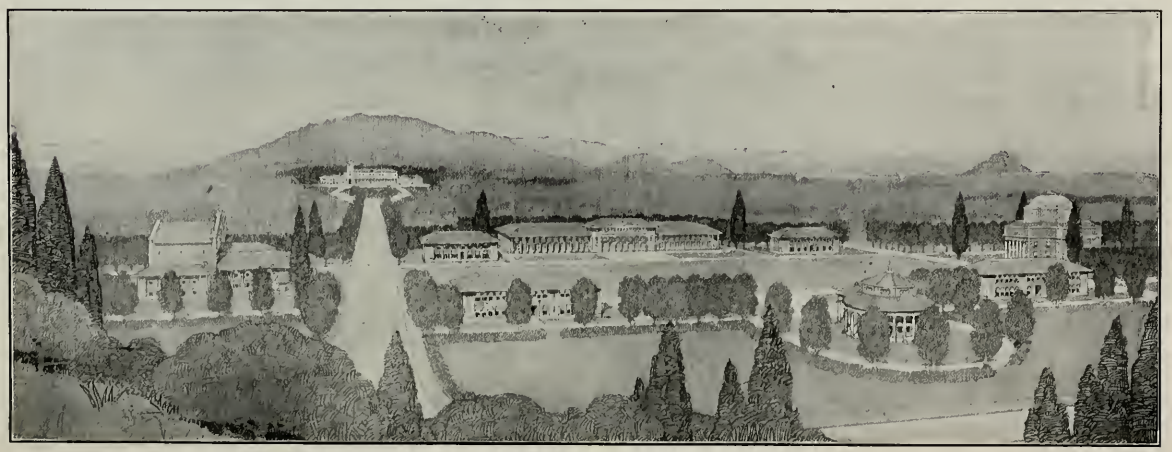
The administration building, at the head of the central plaza, will contain the Chamber of Commerce, the offices of the governor of the colony and his assistants, and of the commissioners of the colony, as well as those of the general manager, his assistants and the real estate offices of the holding company. The Chamber of Commerce will contain an exhibit of the products of the colony, since tens of thousands of tourists pass through the property over the great state highway, and will stop for a



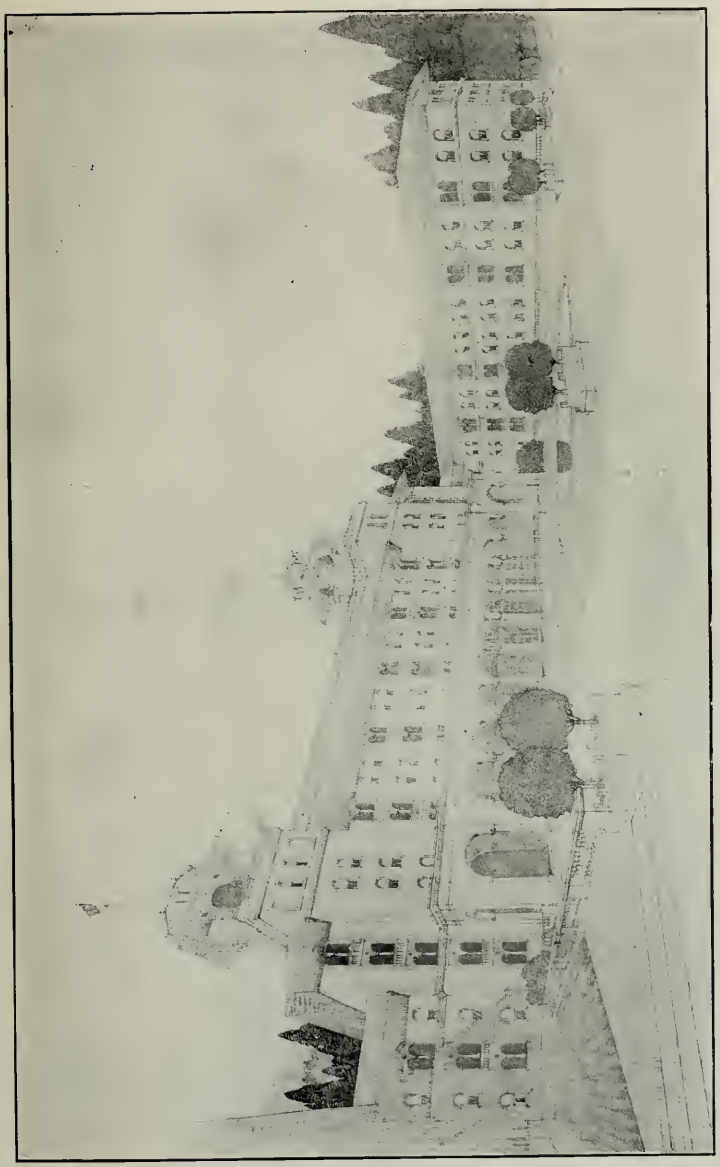
Hotel Overlooking the Civic Center, Atascadero, California

Bliss & Faville, Architects

South Side of Plaza, Civic Center, Showing Front of Great Department Store in Center, Post Office and Bank Building on Right and Office Building on Left



View of Civic Center, Atoscodero, as it Will Appear When Completed in 1915
Bliss & Faville, Architects



Permanent Residence Apartments, Atascadero Community

Bliss & Faville, Architects

greater or less time at the Civic Center. At the far end of the plaza, the opera house, with its lecture hall, its modern moving-picture auditorium, its music hall, and the opera house proper, will balance the plaza from an architectural view-point.

On the opposite side of the plaza from the department store, will be the university and public schools of the colony, and between them the building of the Woman's Republic. The university will conduct lecture courses free to all residents, on horticulture, agriculture, and the many problems that will arise, the members of the board of commissioners remaining permanently as the faculty of the university. In connection with the university will be the experimental gardens and the nurseries of the colony, for the propagating of improved stock, both horticultural and live stock, and the dairy, creamery and all the industries of the colony will be under the general supervision of the faculty of the university..

The school system of the community, while a part of the state school system, which is the finest of any state in the Union, will also have many added features for the special benefit of the residents. It was at first planned to have a number of small schools of the elementary grades throughout the community, with a central high school in the Civic Center, but this plan will probably be superseded by the better one of constructing a large and finely equipped central school building for all grades.

At the other end of the plaza, on the department store side, are located the post-office and bank building. The bank will be a part of the banking system of the department of treasury of the Woman's Republic, but chartered under the state laws to do a trust and savings business. The building will contain a modern banking and safety deposit equipment, and also the post-office of the colony.

The building of the Woman's Republic will be one of the most beautiful of the group and the headquarters of the national organization in the colony. It will be apportioned among the state organizations, each state having its own room, in addition to the national offices.

Under the department of architecture and landscape, the park systems and ornamentation of the entire community are also embraced. Several thousand acres will be devoted to parks, the athletic and club grounds, the golf links and tennis courts, etc.

* * *

New Building Material

A new material of the nature of artificial wood is being introduced by a firm in Glasgow, Scotland, under the trade name of "Tekton." It is claimed to possess the strength and durability of concrete, and is made up in boards or planks, or can be modeled in any required shape. The ingredients are magnesite, granulated slag, chloride of magnesium and "wood flour." Its principal properties, according to claims, are that it is porous, has a low heat conductivity, and is sound-proof, fire-resisting, odorless and not liable to develop dry rot.

* * *

For Services Rendered

Montgomery—I had an awful argument with that carpenter at my house this morning. I had to warn him about leaving a keg of nails out on the walk. I told him they'd be lost.

George—Never worry, Marsh, you'll find them in the bill.

American Institute will Discuss Repeal of Tarsney Act at New Orleans Convention

WALTER COOK, President of the American Institute of Architects, says the repeal of the Tarsney Act will be the special subject of discussion at the coming convention of the Institute in New Orleans. Since the act was repealed by the legislators in Washington there have been many new developments in the situation and some very positive expressions are likely to be heard on the convention floor.

The worst fears for unhappy results following the repeal of the act are apparently being realized in the adopted method of conducting the competition for a post-office building at Portland, Oregon. Bluntly refusing a request for a personal interview signed by six of the seven architectural firms invited to submit designs, the Secretary of the Treasury notified them that the invitation to compete had been withdrawn. These architects, acting under terms of the program which gave to the Secretary the right, at his discretion, to modify any of its provisions, were desirous of making certain changes that they believed would be in the interest of the public welfare and make the competition conform more nearly with the ethics of ordinary business relations, to say nothing of the ethics of architectural practice.

Says The American Architect: "From a purely business standpoint, Mr. McAdoo, as a private individual, would doubtless be within his rights in snubbing any one who courteously asked for an interview. However, as a high public official, and supposedly unbigoted, it would seem that his duty demanded at least open-mindedness in technical matters over which he had jurisdiction but in which his training and experience are, as a matter of course, deficient.

"Several features of the program are not according to precedent established in the past for Government competitions nor to principles generally recognized as fair, equable and professional. Before the repeal of the Tarsney Act the Government followed, in the main, the code of competitions approved by the American Institute of Architects, which, in part, provides that the jury of award shall be made up of members of the profession competent to analyze and determine the merits of the designs submitted. This is thoroughly in accord with the principle long recognized in courts of justice that a man shall be tried by a jury of his peers. Under the terms of the Portland competition the entire authority in the matter of selection and award rests solely with the Secretary of the Treasury, an official whose proper duties are executive and not technical. The whole proposition is as illogical and inimical to public welfare as it would be for any layman to attempt to dominate the highly specialized field of medical practice.

"Under the terms of the program the competitors, after the considerable expense entailed in submitting designs, are guaranteed nothing, as the right is reserved even to withhold the award of the commission. No compensation is provided for any competitor who fails to win the award.

"The rate of compensation provided for the possible successful competitor is five per cent. This very moderate fee appears to include the traveling expenses of the architect, who is required to make as many visits to the proposed building as the Secretary of the Treasury may direct. In one clause of the program, however, the secretary reserves the right to pay any part of the architect's traveling expenses, in addition to the fixed

fee, should the treasury official so elect. But the successful competitor, having prosecuted the work almost to completion, is not sure of any portion of the five per cent honorarium. The Secretary of the Treasury is empowered to dismiss the architect at any time before the completion of the building and to make such payment for services performed as the secretary may direct, meaning, in effect, five per cent or less, or nothing. From the decision of the secretary in this matter there shall be no appeal.

"A recent news item states that six other architects are to be invited to take part in the 'competition' in place of the six from whom the privilege has been withdrawn. It seems probable and is greatly to be hoped that, with conditions as they now exist, architects of good repute will not enter into any such farcical and undignified proceedings. Perhaps this is the end sought and foreseen by the repealers of the Tarsney Act.

"Although this is so obvious as to be almost a truism, that any competition or contract to which an architect is asked or consents to become a party should be explicit and business-like in its conditions, the embarrassing position in which the former competitors find themselves forces us to one of two conclusions—namely, that the terms on which they were asked to compete were not accurately defined when the invitations were extended, or that the architects before accepting the invitation were not sufficiently careful to assure themselves that the competition would be conducted according to the principles of dignity and honor which our Government has followed during the past fifteen years.

"The position to which Congress and Government officials are unconsciously, let us hope, degrading the practice of architecture could not well be more unworthy. However, as dawn proverbially follows the period of greatest darkness, it is to be hoped that the agitation which will inevitably ensue from the present situation, when it is thoroughly understood, will greatly brighten the architectural horizon. General realization that architecture is a highly specialized profession of honorable men, and not the legitimate pawn or plaything of politicians, will some day result in the re-enactment of suitable legislation that will protect the general welfare and no longer render membership in the profession an honor of doubtful character."

* * *

Some Tree, This

The largest tree in the United States is said to be the "Mother of the Forest," a giant redwood in the Calaveras big-tree grove in California. It is supposed to contain 140,619 board feet of lumber. There are, however, many claimants for the honor of being the "largest tree" and the "oldest tree," and these claims, according to foresters, can not always be verified.

* * *

Sounds Like Lew Dockstader

Montgomery—Wonder what profession Ethel Barrymore has decided upon for her son.

George—Going to make an architect out of him.

Montgomery—Why an architect?

George—So he can draw houses like his mother.

Yearly Report of Publicity Committee, San Francisco Chapter, A. I. A.

By THOS. J. WELSH, Chairman; A. S. SCHROEPFER and T. P. ROSS.

AMONG the subjects touched upon were the following:

1. The Committee on Publicity calls the attention of the Chapter to the fact that of the 97 universities in the United States, this State takes the lead for attendance in numbers. And yet, only a few years ago, we were called "The Wild and Woolly West."

2. That some surety companies refuse to fulfill their obligations for the reason that liens were not filed within 30 days after the work in question was completed, the liens being filed within 30 days after the date of recording the notice of completion of the building. Many prominent lawyers make the statement that the law is most indefinite and indeterminate.

3. A decision having important bearing on the expenditure of school bond money throughout the State has been received by State Superintendent of Public Instruction Hyatt from Attorney-General Webb, dealing with the matter of whether or not architects, whose plans have been accepted for school buildings, were obliged to provide bonds to construct the buildings themselves within their estimates in case the contractor's figures came above the estimate, and it is held by the Attorney-General that there is nothing in the present law which makes possible an affirmative answer to the question. The law, according to the Attorney-General's opinion, does not contemplate that the architects should be builders.

4. Cass Gilbert, a distinguished New York architect, makes the statement that before the present generation expires we may yet see a building 1000 feet high. One great objection, though, would be the space required for elevators, and then many people would have difficulty in living in a rarified atmosphere.

5. The Committee on Publicity looks with favor on the efforts of the Home Industry League in their attempt to encourage the use of home-manufactured materials for building purposes. This means a practical way of promoting prosperity to our city and State.

6. Your committee begs leave to report that quite a number of bills have been introduced into the State Legislature calling for new buildings in different parts of this State, which is very encouraging.

7. The United States Government has published several bulletins on the smoke nuisance. The members of this Chapter will find interesting reading in same. Copies can be secured free of charge by writing to the Department of the Interior at Washington, D. C., asking for Bulletins Nos. 39 and 40, and Bulletin No. 49, entitled "City Smoke Ordinance of Smoke Abatement."

8. The committee desires to state to the Chapter that wonders will never cease. Hiram Maxim, now 73 years of age, is still working. His son is now working on a problem of "Death to Noise." That he may succeed is the wish of all citizens at large, and of every member of this Chapter.

9. The Committee on Publicity requests the Committee on Education to write us a paper on how to remodel, heat, light and paint the houses of San Francisco with the "To Let" signs on them, and to educate and bring joy and happiness to many real estate owners of this city who, to their sorrow, employed a designer instead of an honest and competent archi-

tect. The cry of the property owner is "Now is the winter of our discontent."

10. Your committee thinks that the reason so many laws framed in the State Legislature and affecting the architect are called indefinite and indeterminate, and that many front elevations made by architects are sometimes termed aberrations, is, because the work was conceived when the stomach was out of order.

11. It is with great pleasure that the Committee on Publicity calls the attention of the members of the Institute to the opening and improvement of large tracts of land in the vicinity of Ingleside and Lake Merced (notably St. Francis Wood, Forest Hill and Westlake) into good-sized building lots. Thus the sun is allowed to play around the buildings for the cultivation of grass plots and flowers, etc., not forgetting the small patch for the cultivation of vegetables in order to reduce the high cost of living. The roads will be in serpentine form, and with the employment of the skillful architect, and the introduction of fountains and statuary, the tracts can be made very beautiful, and thus create love of the beautiful in the hearts of the men and women who have money to spend, thereby making glad the heart of the architect, engineer and landscape gardener.

12. Your committee would respectfully suggest that the Chapter discourage as much as possible the contractor who in the spirit of revenge attempts to blacken the character of the architect with the owner, for the reason that he was compelled to live up to the terms of his contract. By reason of our indifference, great injury has been done to the profession by these muckrakers.

13. Your committee would respectfully ask the President of this Chapter to use his influence with the State Board of Architecture, urging them to get a move on, and do something to remedy the existing trouble, and protect the organization from the inroads made on it by persons practicing without a license, and to employ outside legal talent if necessary.

14. A short time ago, Mr. Henry Turner Bailey, in a lecture on "Discrimination of Beauty in Art," in his closing remarks used the following language:

> "Continuing to speak of the inconsistencies in the matter of beauty and art, Bailey alluded to the mistake of making railway stations look like monasteries, as frequently observed in Southern California, and of building homes to resemble banks, as often found in Northern California, and intimated that if nature were constructing a railway station or a home she would probably feel no hesitation in making them easily recognizable, rather than concealing their identity.
>
> "Bailey then spoke of the miscellanies of architecture, noted even when it was intended that a home should bear some resemblance to its own nature, and drew a picture of a 'show place' in a Western town, consisting of a Gothic tower on one side and a Byzantine dome, with a gable of a French chateau on the other, finished at the top by a dragooned buttress and at the base by a porch of Roman arches. The material used, he said, was stone for the base, brick for the first story, plain shingles for the second, cement for the tower, and fancy shingles for the gable with a stucco of pebbles in between, and added that he had felt some relief that the pebbles had been chosen rather than broken glass bottles. He advocated more uniformity of purpose and called attention to the fact that such manifestation of art was not based on anything found anywhere in the scheme of nature."

15. A short time ago the chairman of your committee was approached by an architect well advanced in years, who seemed very much discouraged because he was called a "back number." This architect appeared

to have that "gone" feeling; the deep lines in his face showed that his digestion was in bad shape, and he appeared as if he had no one to love and encourage him. The chairman saw that here was a case where he could give advice for the betterment of the condition of his fellow architect. The chairman told him not to be discouraged, that Gladstone did his best work when he was 85 years of age; that Darwin, Adam Smith, Von Moultke, Bacon, Disraeli and many other brilliant men, thinkers and writers, did their best when well advanced in years, and then called his attention to an article entitled "New Elixir of Life from Human Body," written by Dr. Frank R. Starkey, one of the prominent physicians of Philadelphia.

16. Your Committee on Publicity suggests that each member of this Chapter be true to each other for the reason that sincerity and truth are the basis of every virtue. Let each member feel that he is cultivating the vineyard of architecture, notwithstanding his little differences, and be ready to present the loving cup to our members as the great Spartan lawyer, Lycurgus, did when he succeeded in bringing together his fellow statesmen who were distracted by worldly and commercial interests.

Your committee is now looking forward to the time when wisdom and good fellowship will prevail; when all differences will be abrogated, and the loving cup will again be passed around, so constructed that the mud will sink to the bottom and only the purest water will come to the mouth of those who drink. Let us live, all, with equality and friendship of co-heirs and brothers, and allow virtue only to be pre-eminent, as if there were no difference or inequality between one man and another.

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* *

Skyscrapers of Ancient Times

THE tenement house is no new thing. So great was the number of such houses and so badly were they put up in ancient Rome that in 69 A. D. the Emperor Otho, who was then marching against Vitellius, found his way barred for 20 miles by the ruins of buildings that had been undermined by an inundation. The spontaneous collapse of tenement houses was so common an occurrence that little attention was paid to it.

The tenants of these houses have been described by a writer of the time as fearing to be buried or burned alive. Companies existed for the purpose of propping and sustaining houses.

In comparison with the tenements of most modern cities, those of Rome were excessively high. Martial alludes to a poor man, a neighbor, who had to mount 200 steps to reach his garret. That garret must have been perched nearly 100 feet above the level of the street.

It is possible that Martial exaggerated, but it is certain that Augustus, to make less frequent the occurrence of disasters, limited the height of new houses that opened upon the streets to about sixty-eight feet. As this was a remedial regulation and referred only to new houses fronting on the street, it follows that some houses must have exceeded that height.

This, moreover, was irrespective of the breadth of the street. In Berlin the medium width of the streets is twenty-two meters, and in Paris the narrowest streets are nearly eight meters wide, while the streets of Rome extended only five or six meters, and on these narrow streets the tall houses were built. Light and air must have had some difficulty in penetrating those narrow, walled-in passages.—Brooklyn Eagle.

Estimate Hazards of Building Plans

By J. M. VOLLMER*

RECENT investigation has developed the fact that most of the financial failures in building and construction specifications are caused by omissions, errors, obscurities and unrestricted power of interpretation in building and engineering specifications. This power is generally so sweeping and variable that it is impossible to anticipate how its exercise will ultimately result. It has been found that these failures are in most cases the result of the contractor being forced by this drastic power of interpretation to supply labor and material not originally contemplated.

In specifications the following phrases are met with daily:

"His decision in all matters shall be final and binding upon the contractor.
"His decision as to quality and quantity shall be final upon the contractor."

Why should any matter of quantity and quality be left open for decision when they can easily be fixed with mathematical precision, and should be before the purchase price is determined?

"Details to be furnished later."

It is possible in most cases to prepare details before the contract is let. Why not do it?

"All matters of controversy or disputes of whatsoever kind that arise shall be determined by the architect or engineer, and his decision shall be final and binding upon all parties," etc.

"Their decision (the architects') as to any and all questions, matters and things, and in construing any of the terms and provisions of this contract (the specifications are made a part of the contract) shall have the force and effect of an award, and shall be final, binding and conclusive to all intents and purposes, and in all places, upon the parties thereto."

Such unreasonable and unnecessary authority to be exercised without limitation or restraint by a single individual is wholly unknown in any other line of business or profession.

The ultimate tribunal should be impartial, upon which the contractors and furnishers of materials should have representation. Either party should be able to bring questions involving the exercise of discretion under the contract before the tribunal of arbitration, where the rights of both parties would be looked upon from an equal standpoint.

The first essential of a specification is that the exact work to be done should be precisely defined, but many specifications deal in generalities and comprehensive clauses, failing to state specifically the actual amount of work to be done or the exact nature of the obligation to be assumed. This leaves many items in the specifications to be further construed, and the architect or engineer may be a "Loose Constructionist," in which case undue liberties may be taken with the contractor, or owner, or concern supplying material, and often this is carried to great extremes.

The most astonishing phase of this situation is that the conditions herein referred to are absolutely unnecessary, causing enormous loss, friction, litigation and general unsatisfactory results, but benefit no one. This condition denies many an owner the extended competition, the low price and the proper representation to which he is entitled.

One of the most serious effects of the present system is that it constitutes a tribunal with despotic and unlimited authority, upon whose favor or disfavor rests the success or non-success of the performance of a contract.

*Louisville, Ky. This article was written for the Southern Architect and Building News.

The present system employed in the preparation of contracts and specifications is a relic of antiquity and is an outgrowth of the practice established years ago, when the builder was merely a mechanic, working under the personal direction of the engineer or architect, where small amounts of money were involved. Under these circumstances the contractor was practically, not actually, the employe of the owner.

This is the day of heavy contracting and construction operations, when large amounts of capital are involved, and yet we are attempting to proceed under the obsolete methods, which were possibly sufficient for primitive conditions, but are absolutely inadequate and out of date now.

The idea that most losses and a large per cent of the failures in the construction and material business occur by pricing the work too low is erroneous. The facts when investigated show that in nearly every case the severe losses can be traced to some arbitrary or unwarranted position of the author of the specifications, many times in remedying his own error, or from a drastic interpretation of some clauses that are left very indefinite in preparing the specifications.

This condition affects contractors, builders, material supply houses, manufacturers of building materials, concerns furnishing materials or installing them, plumbing and steamfitting supplies, electrical equipment, cement, steel, stone and all of the many ramifications that enter into the materials for building or engineering projects. Inasmuch as this includes all buildings and railroad construction, county roads, streets, sewers, water works, etc., it is of itself the largest of any one commercial line in the United States today.

The result of this investigation indicates that there are two principal underlying causes for this condition:

First—The lack of clear, accurate and standard conditions and detail description in preparing plans and specifications and designing materials.

Second—The making of the architect and engineer the final judge of all matters, including his own acts, which destroys incentive to faithful service and prevents careful preparation of specifications and plans, since he is not held responsible for errors, being the final judge of them.

As a remedy for this condition, five propositions are submitted, as follows:

1. To define accurately and to standardize, wherever practicable, plans and specifications in order to eliminate unnecessary hazards and uncertainties in construction contracts.
2. To reduce the cost of improvement to the owner.
3. To give the contractors and surety companies a proper understanding of the obligations they assume.
4. To establish contracting and suretyship on a more stable and definite basis.
5. To provide for the settlement of differences by some equitable, constituted authority.

There is also a general demand for a law similar to the one in effect in Pennsylvania, which is as follows:

"That no provision in any contract providing either in express words or in substance and effect, that an award of appraisement of an engineer, architect, or other person shall be final or conclusive, nor any provision that a certificate of an engineer, architect or other person shall be final or conclusive; nor any provision that a certificate of an engineer, architect or other person shall be a condition precedent to maintaining an action on such contract, shall oust the jurisdiction of the courts, but any controversy arising on any contract containing such provisions,

or any of them, shall be determined in due course by law, with the same effect as if such provisions were not in such contract."

This suggested relief has been adopted by many commercial and business exchanges, both national and state, by individuals, bankers, commercial houses, companies making loans on improvements, and many other important commercial organizations.

Credit men were parties to this original movement, the National Association at Cincinnati recognizing its importance, and that this proposition has a direct and important influence upon the credit of all commerce connected with materials used in the erection of buildings and engineering projects, also affecting owners who are so often confronted with the necessity of an unexpected outlay or investment. It is important in its bearing upon all who are in any way connected with selling materials, consequently it affects all financial interests transacting business of this nature.

Since a large fractional part of the commerce of this country is in building and engineering operations, it makes this proposition an important matter, if not the most important, to consider in connection with credits. The National Association of Credit Men passed a resolution unanimously indorsing the movement, and requested state organizations to use their best efforts to have a law enacted in each of their respective states similar to the law in Pennsylvania, and take other necessary steps to cure this evil.

The uncertainties, ambiguities and lack of business methods that are shown to be common practice in the building business today are astonishing; the understanding of this ancient and hazardous method is of most vital importance to credit men, as they are daily dealing with business based upon the conditions set forth herein.

This investigation explains why so many men in lines allied to the construction business make promises of payment in perfectly good faith, depending upon the fact that they have supplied material or executed work in strict conformity with agreements and good practice, which should be precedent to making the payment due. Yet when they go to get their orders on the owner for the money, instead is received a rejection of the material or labor because it is not to some one's "satisfaction"—this satisfaction being a condition of the specification, and exercised without restraint.

It is proposed to establish a standard for work and material, instead of leaving these important matters open to the uncertainty of some one's "approval" without any restraint, limitation or specific definitions.

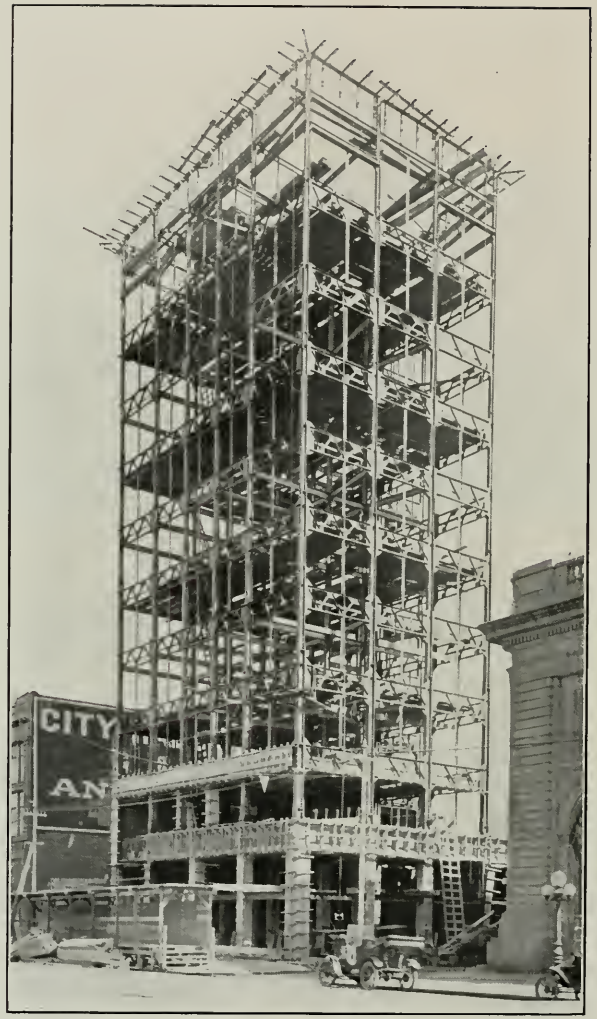
It is urged and requested that the credit men consider these propositions, in which they are so directly and vitally interested, with a view to stopping this uncertain condition in business transactions, and assisting and supporting its objects.

The amount of money lost annually by reason of the obsolete conditions described is very large, hence the important bearing the question has on financial responsibility. Therefore it behooves all credit men to investigate carefully and consider this situation, and insist upon its correction where they extend credit in the material line. The fact of a firm's high financial standing is of little value when these conditions are encountered.

During the course of investigation into this subject one case was found where a profit of two hundred thousand dollars on a contract was changed to a quarter of a million dollars' loss due to loose specifications and arbitrary decisions.

Pumping Station for the Spring Valley Water Company, Sloat Boulevard, San Francisco
Built by Bluxome & Company

Court House for Ventura County, California
H. C. Martin, Architect



Steel Frame, Lucy Thomson Building, Oakland
Meyer & Reed, Architects

The Steel and Iron Industry of California

IV—The Western Iron Works

Sixty-one years a factor in the iron and steel industry of California, enjoying a record of active business dating back almost to the gold rush of '49, taking an important part in the building of the old San Francisco and a still more prominent part in the rebuilding of the new San Francisco, with hundreds of testimonials to the excellence of its work, performed in nearly every large city on the coast and even in the distant Hawaiian Islands—these are some of the outstanding facts and incidents in the history of the Western Iron Works of San Francisco, whose secretary, Mr. H. H. Morris, gives the following interesting outline of the company's half-century activity:

SIXTY-ONE years ago, in 1852, during the days of the vigilance committee and before the advent of either a gas, water or street-car system in San Francisco, John R. Sims started an unpretentious iron works, quite small, but at that time of a size in proportion to the demand for the material. This was long before the process of manufacturing steel had been discovered and at a time when the uses for iron in building construction were exceedingly limited.

The business established by Mr. Sims gradually developed, new partners were taken in, and the firm added new lines of ornamental work which the demand at that time called for. For years they made a specialty of vault linings, grilles, fire escapes, iron fences, stair work and cell work. The ornamental iron doors and stair work on the Hibernia Savings Bank were executed by this firm and are in excellent condition today, though they passed through the fire of 1906.

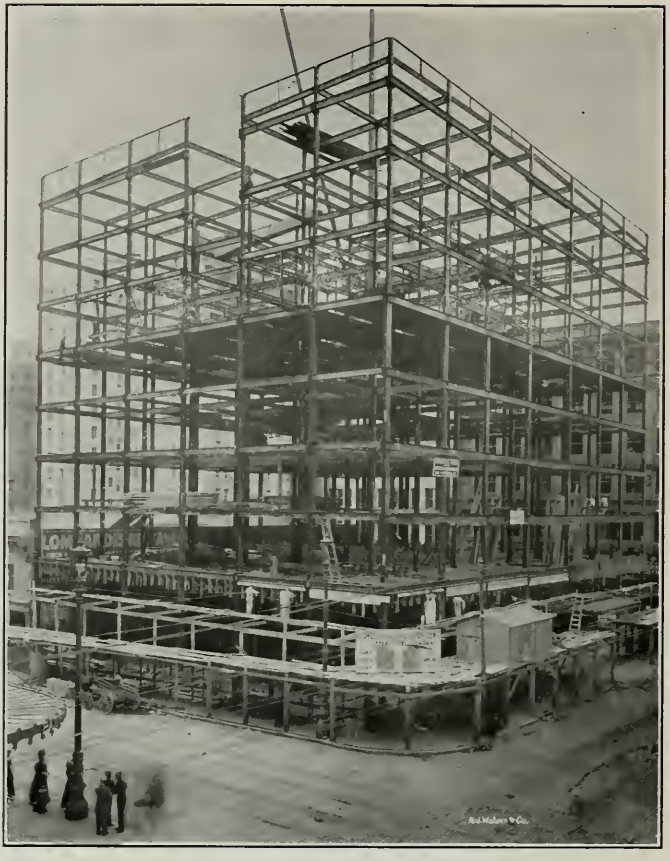
Anyone who has had occasion to spend a short time—either a voluntary visit or an enforced one—at the Stockton jail, will have been in touch with examples of the Western Company's cell work. Other specimens are found at the state penitentiary at Salem, Oregon.

The contracts mentioned were all completed under the present management, that of Mr. W. B. Morris, and since he joined the firm in 1875. The business was incorporated in 1889 under the name of the Western Iron Works. Shortly before this the iron work for the Union Iron Works was fabricated.

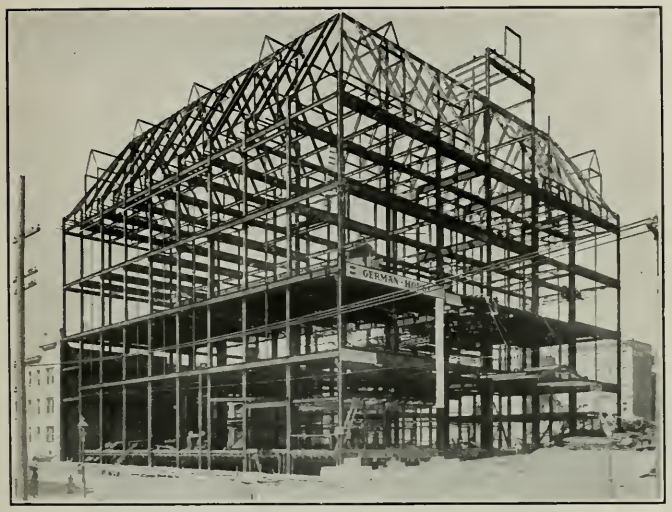
Several years before the catastrophe of 1906, the business demanded a larger working space and an additional lot of land was acquired, the firm then branching extensively into the gas-holder business in addition to their other lines. Those who are familiar with North Beach will recall the large gas-tank which stood there before it was removed to make room for the Panama-Pacific Exposition. Gas-holders at Port Costa, Vancouver and Washington were other contracts of note.

Then came the fire of 1906, leveling the shops to the ground. It was a rather remarkable coincidence that the diagonally opposite corner of the block bounded by Beale and Main, Mission and Howard streets passed through the fire unscathed.

Nine days after the fire, while the bricks were still hot, the Western Iron Works started to rebuild. A small corrugated iron office was built, and to show the optimism, enterprise and energy of the firm, this building was pictured on their letter heads with the inscription, "the first office erected in the manufacturing section of the burned district." Forecasting



Steel Frame, Hotel Sutter, San Francisco.
Fabricated by the Western Iron Works *L. B. Dutton, Architect*



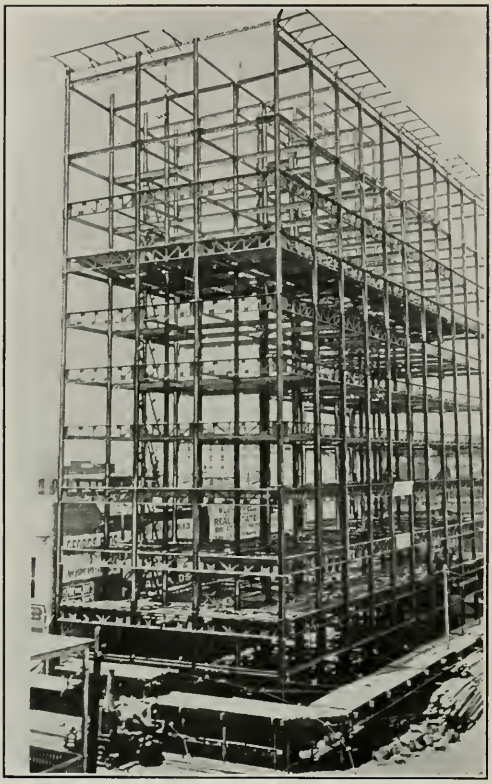
Steel Frame, German House Association Building, San Francisco
Frederick H. Meyer, Architect

the increased business which was sure to follow the fire, more land was acquired and additions made to the shops. Although the firm's loss by fire was heavy, the stock of steel material was not damaged, and they began at once to supply the insistent demand for steel work, which characterized the period in all lines up to 1908.

After 1906 the firm discontinued the lighter ornamental work—such as the manufacture of fences—and confined their efforts to structural steel work and to the manufacture of fire escapes. A stringent fire ordinance having been enacted shortly after 1906, the demand for steel work and fire escapes increased and the firm was fortunate in securing a large share of the work. Contracts were executed as rapidly as the material could be gotten out, often requiring considerable overtime and the putting on of night shifts. The following are a few contracts worthy of note: The Pabst Cafe, Powell and Ellis streets; the Satter building, the Telephone buildings in Sunset and Mission districts, San Francisco, and the Telephone building at San Jose, California; the Southern Pacific power station at Fruitvale, the penitentiary at San Quentin, Swift & Co.'s plant in San Francisco and many others.

In the early part of 1913 new buildings were erected of brick and steel.

Contracts of considerable size, varying between 500 and 1000 tons, which were completed during the past two years, include the Sutter Hotel, Kearny and Sutter streets, L. B. Dutton Co., architects; the German House Association, Geary and Polk streets, F. H. Meyer, architect; the Griffith-McKenzie building, Fresno, Geo. W. Kelham, architect; the Libby,



Steel Frame, Griffith-McKenzie Building, Fresno, California
Geo. W. Kelham, Architect

McNeil & Libby plant of nine buildings at Sacramento, and the Lucy Thomson building, Oakland, Reed & Meyer, architects.

The firm is at present engaged in fabricating the steel for the Carpenters' hall, the Columbus school, the Schmiedell Estate building, and the large plant for the Hawaiian Pineapple Co. in Honolulu, T. H.

* * *

Not on Schedule Time

Jones—I think this pyramid is the greatest piece of work I ever saw.
Clancy—Why?
Jones—Why, it took the contractor 3000 years to finish the work.
Clancy—Begorra, I hope that contractor isn't going to build the fair.

Need of Honest Contractors

EXACTLY one hundred per cent of adult humans want and need to own or build for themselves a home. In fact, the home-getting principle is universal and an indispensable necessity. Almost ninety per cent of the people of this country dread and fear to undertake the construction of a home for the protection of their families because of the unnecessary mystery and unscrupulous tricks in which the assembling of building materials and the employment of labor for building purposes are enshrouded. There is no reason why the price of an ordinary house could not be just as freely quoted as the price of shoes, neckties, shirts or any other indispensable necessity which goes to make up the current expenditures of civilized existence.

Without being able to define it as such, the ninety per cent who hesitate building materials and the employment of labor for building purposes are going against a game, and usually a brace game, and not against a business proposition where the value of the thing delivered can be reasonably measured by the cost of its production. This is to a great extent the fault of the producers of building material, for the reason that they never advertise their goods as intelligently as it should be done. More than sixty per cent of the producers of building materials of all kinds use the expression: "We prefer to work in the dark and not let people know too much about the particular qualities, uses and adaptabilities of our goods. We prefer to work in conjunction with a selected list of contractors and agents, and with their assistance pump the people. For the money comes out of the people anyhow—the man who is going to build is the man who has to pay, and the more we get out of each individual builder the greater the aggregate of the spoils to be divided."

This is the style and type of reasoning that the average producer of building material assumes and holds. In this there is the greatest possible mistake, because such a process of reasoning, such an attitude towards the man who pays has just exactly the opposite result from that desired —ninety per cent of the people who would go to the idea of building are afraid of the methods of the mysterious system, which confines its efforts to the ten per cent who are bold enough and rich enough to go against the brace game. Ninety per cent will stand aloof and prefer to go without that home which is every civilized man's ambition than to dare attack the den of lions.

By far the most important point for consideration by those contemplating the building of a home is the wisdom of building of properly selected materials and the choosing of a contractor of unquestionable reputation for honest, reliable workmanship. The average contractor is capable and trustworthy, but in this profession, as in all others, there are those whose methods should bear the light of investigation. His operations are insidious and deceptive and not until after the building has been erected for something like a year does his perfidy become apparent. While in the process of construction he may appear efficient, careful and sincere in his promise to give honest workmanship for the compensation received, yet this is only a mask to shield his parsimonious selection of materials, during which his inventive mind creates a method of construction that conceals the real defects that might be otherwise observed.

Economy in the selection of the contractor does not always come within the meaning of that term, for it is often the case that the owner

wishes he had paid $300 more to some reliable man who could be trusted to put in his best efforts to build a dwelling that would justify the expenditure. Not until the plastering cracks and falls, the doors and windows come apart and the finish rubs off the trim, to say nothing of the burning out of the heating system, does the owner realize that his "economy" has been ill-placed and that the cost of repairs will greatly exceed the extra amount which he might have had to pay for dependable work.

It is eminently fair, though, to let the contract to the lowest bidder; but the owner should be sure to invite only contractors of known reputation for doing conscientious work to submit their figures. As in all lines of business, the contractor noted for his doing work cheaply, with price as his only solicitor, should be assiduously avoided, for he will prove by far the most expensive in the long run. When reasonable, it is essentially more economical to accept the bid of the best man. It is a natural law that to give satisfactory work a contractor must be allowed a reasonable profit, and common sense decrees that he will not perform work at a loss to himself.

If the contractor is conscientious he may in many instances make changes in the specifications which will effect a substantial saving in the sum total that is to be paid for building the house. For not all architects have engineering knowledge or experience, and plans and specifications especially designed for one building site will assume an entirely different contexture on a lot of varying contour or in separate localities where materials and the procuring of them form a problem dependent upon local conditions. If the contractor is learned in the building of dwellings he will, if he is honest, make alterations and changes in the specifications to meet local conditions and in cases where his knowledge prompts him will make substitutions of smaller or less expensive materials if the original specifications be superfluous.

The selection of a good man is not at all a difficult matter. Simply request that he show some of the homes he has built, preferably one or two that were constructed some few months or a year back. He will be glad to have his work inspected if he is reliable. And by all means the owners of those buildings should be talked to. They are the real judges of the situation and if they are satisfied with the work done an emphatic stride will have been taken, for by the natural order of things they are wont to adopt a critical attitude toward the work done. Besides, the prospective builder can see for himself the quality of work done by the contractor.

Contracts for the general construction, the plumbing and the heating should be let separately. If the entire work of building the house is let to a general contractor he will in turn sublet the plumbing and heating to subcontractors on a competitive basis and will exact a charge of at least ten per cent from the owner for his trouble. By letting the contracts separately the owner can thus save this ten per cent by securing his own subcontractors.

The proper way to have a contract drawn up is by an attorney. While the blank forms of contract usually carried by architects cover in large measure the requirements of the home builder, yet in most cases there are special features desired and certain changes to be made, and it is distinctly advisable that an attorney draw up such requirements.

Mantel Piece in the San Francisco Press Club's New Home
Made in Sarsi Studios *Frederick H. Meyer, Architect*

A set of specifications does not constitute a binding form of contract, as seems to be the opinion of some people. The specifications simply indicate the kind of workmanship, the kind and quality of materials and other items which cannot be conveniently shown or specified upon the working drawings.

Except in cases where the contractor's reputation and financial standing are unimpeachable, he should be required to put up bonds to complete his work in a satisfactory manner. It should be remembered that the owner is responsible by law for the payment of the bills for material or labor, the contractor being merely an agent for the owner.—Rock Products.

Plea for a Cement Show at the Panama-Pacific International Exposition

By CHARLES E. VAN BARNEVELD*

THE Panama Canal, which someone has aptly characterized as the "greatest liberty ever taken with nature," is a triumph of American enterprise and American engineering skill. The nation is justly proud of this achievement and proposes to celebrate it by holding an international exposition in San Francisco in 1915. I wish to lay especial emphasis on the word international. Because of its location, the exposition is often thought of as California's exposition. While the majority wish it success and hope to take it in, a great many people do not seem to realize that practically everyone who occupies a position of responsibility in American professional and industrial life owes some direct thought and attention to this exposition now.

In a sense California is the host. In a larger sense, however, the nation is the host. The nation, through the President and the Congress of the United States, has issued the call and has invited world-wide participation.

The importance of the event we are celebrating is such as to lift one's thought above the merely sordid question, "What is there in it for me?" The exposition makes a direct appeal to every American citizen—first to his patriotism and next to his pride in the industry which he represents. It offers to every beneficiary of the industrial prosperity which has marked the last decade, an opportunity to contribute to the most effective educational work that could be undertaken. A well-conducted international exposition is a great university in which the officials are the regents, the exhibits are the faculty and the public at large is the student body. If this exposition is a success everybody will be benefited. It is our individual duty to unite in a national effort to insure this success, regardless of whether we may or may not foresee any tangible individual benefits to result from our participation.

The suggestion has been made that because manufacturers of cement and its products operate in comparatively small territories and are not having much trouble in disposing of their output, they have little incentive for the trouble and expense of making an exhibit; that it will be difficult to interest the cement and cement products trade unless direct, tangible local benefits can be shown. I do not believe the trade will take this narrow view of the matter—a view unquestionably detrimental to its best interests.

The two great factors of modern civilization are electricity and cement. The more spectacular of these—electricity—has been featured at several expositions. In 1904, the year of the last international exposition, held at St. Louis, the cement and concrete industry was a "youngster." Today the industry has attained its majority. Every great movement, every important industry requires a certain amount of broadcast sowing to educate the public mind. This has been neglected in the case of the cement industry. While it has made great strides in the last ten years and has, perhaps, outstripped most other industries in the matter of growth, still, it has never been properly introduced to the public, and the public has little conception of its full importance.

*Chief Dept. Mines and Metallurgy, Panama-Pacific Exposition.

A cement show of national scope, properly conducted on a scale commensurate with the importance of the industry, would furnish a most effective and a most economical advertising medium from which the industry would derive incalculable benefits, both direct and indirect. It would draw conventions of engineers, contractors, builders, dealers, etc., all of which would stimulate the educational value of and interest in the show.

Hundreds of thousands of people from all over the world, representing a picked and necessarily well-to-do class, will visit this exposition. They will be awakened to the importance of cement in modern engineering work and to the diversity of uses to which it may advantageously be put in every-day life; to its durability, its resistance to fire and, withal, its artistic possibilities. The exhibit would undoubtedly exert a favorable influence on the public mind in connection with legislation regarding dust, containers, etc. An artistic display, associated with the name of any cement manufacturing plant or any manufacturer of cement products, would certainly attract the attention of visitors from the section supplied by such exhibitors.

The Palace of Mines and Metallurgy is comparatively small and the demand for space is going to be heavy. The net available area for the entire industry in all its branches, foreign and domestic, is 170,000 square feet. The most I could set aside for the cement industry would be 25,000 square feet, and that would be giving it preferential treatment. This space, properly utilized, would be adequate for a representative, collective exhibit of the industry.

A part of the exhibit might be in the form of a small building designed to represent in itself many phases of concrete building construction, methods of form and cribbing construction, types of reinforcement, methods of finishing and coloring walls, floors, ceilings, etc.

Most of the work could be shown in various stages of construction, for instance, columns with one or more makes or designs of forms adhering to the concrete would show how forms are made and fastened and how they look when in place. By omitting the concrete from a section the reinforcement could be shown.

This plan could be extended to every important part of the building. Methods of construction, moulding, plastering and surface finishing, artistic and ornamental work of every kind, all may be shown in various stages, all set into the exact positions assumed in actual work. The materials, tools and plant would be shown in conjunction with the various exhibits. Adjoining the Palace of Mines is the Esplanade, where place could be found for an Italian garden to illustrate the adaptability of cement to landscape gardening. Climatic conditions in San Francisco and the rapid plant growth of this section make this possible even at this late date.

To conclude: The educational and advertising possibilities of a properly arranged cement show at this exposition are unlimited. It will bring the building public, on the one hand, and the architect, the engineer, the contractor, the builder, on the other hand, into close touch with every detail of the concrete industry; it will do this under conditions and in an atmosphere which cannot fail to impress them favorably. It will undoubtedly stimulate the demand for concrete over a competitive material and will educate the public to new or little appreciated uses for concrete. The cement trade, in all its ramifications, can well afford to spend a hun-

dred thousand dollars or more, if necessary, on this and reap a hundred fold in growth and expansion.

The Panama-Pacific International Exposition is providing, without cost to accepted exhibitors, the housing and necessary space for their exhibits, ample fire and police protection, general janitor service, splendid transportation facilities, one-way freight charge and free return of exhibits to point of origin, general lighting of the building, cheap electric current for special lighting or power service. Exhibitors are assured of an immense audience drawn from the four quarters of the globe, and they have the opportunity of securing valuable awards by the international jury.

* * *

Progress of Panama-Pacific Exposition Construction Work

IT is officially announced that all of the main exhibit palaces of the Panama-Pacific International Exposition will be completed nine months before February 20, 1915, the opening day of the exposition, and that some of the buildings will be completed even earlier.

This official announcement, following the promise of the fair management made more than one year ago that the exposition would be completed nine months before the opening day and that the exhibit palaces would be built upon a definite schedule, confirms all that was said before. The preparations for the event are further advanced today than were those of any other international exposition at a corresponding time before its formal opening. The work is now proceeding upon schedule; there will be no periods of delay or of congestion in the work. Building contracts provide bonuses for completion under the time limit.

A tremendous amount of preliminary work has been accomplished. Based upon the total amount of preparation required, the Division of Works estimates that today the exposition is more than two-thirds completed.

The exposition site, covering 635 acres of land close to the heart of one of the most picturesque residential sections of San Francisco, was long since cleared of all old houses and other structures and has been completely fenced in. The underground work has been completed almost throughout. It included the reclamation of seventy-one acres of land from the bay of San Francisco; the installation of a high-pressure water system for fire purposes, which is two-thirds completed; a low-pressure service water system, which is also well advanced; an extensive drainage system, completed in the amusement concessions and foreign nations district and nearing completion in the main exhibit district, where it is being carried along with the buildings themselves, and the laying of underground conduits for the electric wires for the transmission of light and power.

At the present writing ten of the huge exhibit palaces of the Panama-Pacific Exposition are under construction; of these ten the frame work of three is now rising and the flooring of practically all of the others is completed and the assembled parts are to a great extent ready to be raised to place. More than seventy million feet of lumber will be used in this main exhibit section; more than twenty-five million feet have already been delivered and forty million feet contracted for. Thirty-two steamers are carrying the lumber.

The streets, avenues, roads and paths are laid out, the curbs are well along and a contract for the delivery of 70,000 cubic yards of road rock, with an ample time limit, is being fulfilled.

A standard-gauge railroad is being laid, the tracks being now nearly all down and parts of the road in operation, conveying material. A freight ferry slip has been completed and is receiving car floats regularly. A commodious harbor on the water front, with a system of wharves, is receiving steamers daily, with lumber and other building supplies.

The Service Building, housing the staff of the Division of Works, is completed, even to the gardens and lawns surrounding it, and has been in use all this summer.

Of the twelve great structures in the main group of exhibit palaces, one, that of Machinery, is erected, roofed and floored and is now receiving its covering of imitation Travertine stone, and its cornices and pillars.

The Palace of Education is floored and the frame is about half up. Framing of the Palace of Food Products has been commenced this week and the floors of the Palaces of Agriculture, Liberal Arts and Manufactures are nearly completed, while those of the Palaces of Varied Industries, Transportation, and Mines and Metallurgy are being rapidly laid.

The contract for the construction of the Palace of Fine Arts has been let, and those for the Palace of Horticulture and the Festival Hall will be awarded within a few days, all to be completed well within the time limit.

Many other lesser structures are built or being built with a rapidity characteristic of the work of all the contractors. An example of this industry is furnished in the case of the building for the Republic of Honduras, ground for which was broken August 20. This building is nearly all in frame and its floor is being laid.

The extensive park system of the exposition is advancing with as great rapidity as the structural work. Along the water front, or Marina, the grass for the broad esplanade is growing luxuriantly and the sites of other parks and gardens are now graded and receiving their covering of fertile soil and enriching material. The shrubbery and plans for the landscape engineering scheme are all on hand, ready for transplanting when desired, which will begin this autumn, with the erection of the exhibit palaces.

* * *

Foundations of Exhibit Palaces, Panama-Pacific International Exposition

IN the early history of San Francisco, the area to be occupied by the main exhibit palaces of the Panama-Pacific International Exposition in 1915 was a tide flat, some portions of which had been dredged to accommodate shipping. In recent years, however, private interests had built a sea wall across the north of the basin in an easterly and westerly direction and filled a portion of the area inclosed. This work was not completed and it remained for the Exposition company to fill the inland basin by means of suction dredgers.

After the Exposition's fill was completed, a number of tests were conducted to determine the supporting power of the soil at the depth of what probably would be the spread footing bottom. The result of these tests indicated that the supporting power of the dredger sand was very low, namely, about 400 pounds per square foot, which prohibited the use of this type of footing.

Pile tests were made also, and it was found that the fill, in settling, gripped the piles in such a manner as to act as a load upon them. This caused the piles to penetrate into the original bottom and the conclusion was reached that unless the piles were sufficiently long they would settle with, and more rapidly than, the fill when the superimposed load would be brought upon them. Therefore, after a careful investigation, the engineers were forced to the conclusion that it would be inadvisable to carry any given load by skin friction alone. The general character of the soil under the dredger fill was clay, mixed with blue mud and water, underlaid with a layer of green sand and clay, and, finally, hardpan, the hardpan being located all the way from 30 to 120 feet below the surface. In view of the great number of piles required, economy of length was an important factor, and it was decided finally to drive all the piles into the layer of green sand and clay overlying the hardpan, to a one (1″) inch penetration at the last blow.

In general, the character of the soil underlying the sites not covered with the dredger fill was yellow beach sand, soft clay and sand, hard green sand and clay, and, finally, yellow hardpan except in areas that had been filled prior to the commencement of Exposition activities. It was decided to use, in general, piles for the support of all buildings, walls and special loads in these areas, as well as in the recently filled area. The reason for this was three-fold: (1) Uniformity of construction; (2) greater safety in case of earthquake, as portions of the site were originally submerged and past experience in San Francisco indicated that structures were most affected when they were supported on spread or raft footings, and (3) in giving a value of 3,000 pounds to the square foot to the sand it was found that a spread would cost as much if not more than a pile footing.

The actual length of pile driven through the site will vary from 60 to 75 feet, and in all cases an assumed load of 20 tons was taken as the value of one pile. The oddity of this constant unit, inasmuch as the value of the pile usually depends upon skin friction and length, is explained by the fact that, in the case in point, tests were conducted that confirmed the selection of the amount named.

Sketch for Spanish Restaurant, San Francisco
Montgomery & Montgomery, Los Angeles, Architects

Concerning Water in Concrete Mixtures

THE occasional failure of important concrete structures, when subjected to floods or other unexpected conditions, indicates that low cost and profits are given more consideration than strength and durability. Then, again, from the writer's observations of the work of others, he is led to believe that while a careful study has been made of cement, sand, and aggregate, the function, purpose, and effect of water in the mix is little understood.

Cement, sand and the coarser aggregates are inert solids without cohesive or adhesive power. Water, on the other hand, is a fluid without adhesive or sticking power to join two substances together. But water has a very strong surface tension. This is exhibited in what is known as capillary attraction. It is water that binds the inert materials together. This binding power is greatest when every particle of cement, sand and aggregate is covered with a continuous film of water. If too little water is present, or if it is not evenly distributed, the water film will be broken. If, on the other hand, the thickness of the film is increased to the filling of the interstices between the aggregate this binding power decreases until it is nothing when the solid particles of the mix become immersed in the water.

In addition to being a binder of the solid elements of the mix, the water acts as a lubricant, allowing the solid particles to slip on one another and and assume positions resulting in smaller interstices. This increases the density of the mass, and also the capillary attraction of the water film, provided there is not sufficient water present to destroy this film tension. When the excess of water destroys film tension the solids become separated or "suspended" in the fluid. The finer particles of cement "float" in the water, filling the interstices or settle from the mass on agitation, and at the same time the "lubrication" of the larger particles is not increased.

It is the finer particles of the cement that develop the greater strength, but when suspended in the fluid or separated from the mass, the "hands" of these particles are not sufficiently long to bridge the water gap separating them from one another or from the larger solids.

It is far easier to build up the water film by careful addition of water than it is to distribute the water after it has been added. If excess of water is added to one part of the mix, so as to "float" the fine particles of cement, it is a question if the film tension can be restored by mixing this with drier materials. This kind of concrete may appear all right, but one part of the mass will not be sufficiently lubricated so the solids can assume the positions for greatest density, and the other parts will be over wet so that the particles of solids will be separated by excess water, and film tension will be lacking in either case. When water is poured or flows from a pipe or nozzle, this is sure to be the effect. The less nearly the cement fills the interstices of the aggregate the more pronounced the effect will be from improper watering. When the water is in just the right proportion to furnish the lubricating effect and the greatest binding power, these forces tend of themselves to draw the particles together into the dense mass.

The third property of water in concrete is to furnish the element that causes crystallization of the cement, giving to the concrete its strength.

The observation of the writer leads to the belief that the crystal takes the best form when the water is present as just described. But this will not give sufficient water for the complete growth of the crystal. More water must be fed it during the time of curing in order to grow it to maturity.

The writer has used much bank gravel in concrete construction. He has found it economy to screen the fine from the coarse aggregate. Mix the fine aggregate and the cement, and then mix this with the coarse aggregate, thoroughly drenched. Following thorough mixing, water as needed is added by sprinkling until tempered to the proper consistency. The sand, fine aggregate, should be just sufficiently damp to cause the cement to adhere. This dampens the cement and establishes capillary attraction. The coarse aggregate has but little capillary attraction and, on mixing, its excess of water is taken up by the superior attraction of the finer materials. In this way the material is all bound together.

With proper watering and curing the same strength is developed with one-half the cement as with improper watering. And when the work is properly managed the cost is very slightly increased. This is true of either hand or power mixing. It is simply a question of whether it is best to add brains or additional cement to the mix.—Municipal Engineering.

* * *

An English Appreciation of the New York County Court House

"THE powerful and arresting design, which has recently won the competition for the New York courthouse, together with Mr. Hastings' paper at the Institute, brings again very forcibly to our minds the extraordinary achievements of recent American architecture. We can not blink the fact that not only are such designs as Mr. Guy Lowell's not made in this country, but that it is impossible at the present moment for us to conceive them. We may excuse ourselves by saying quite truly that the opportunities are lacking for work on this scale, that our towns possess no sites or characteristics suitable to monuments of such majestic simplicity, but at bottom we realize, in making such excuses, that we are only accusing ourselves. The deeper question is, whether as a nation we have in our hearts the desire for such things, or, if we admit the desire, whether we have the courage and imagination to conceive them. We talk of Empire, and we are said to possess one-fifth of the inhabitable globe, but what building have we made during the last hundred years which in any way reflects this imperial position? Is there a single English monument built since we have possessed an empire at all, which its inhabitants have seized upon as a symbol? What modern building has touched their imagination? To Frenchmen all over the world the Paris Opera House is just such a symbol. It stands worthily for a great deal of what is best and most typical in their civilization. It seems very possible that this courthouse of Mr. Lowell's will take the same position for Americans. It appears to represent a people who have faith in themselves and their destiny. It is a conception of great power and directness. If the bickerings which even in America unfortunately follow all competitions prevent its erection it will be a calamity of national significance. No public building of modern times seems to us to epitomize so finely the best characteristics of the age—power, law, and order."—From The Architects' and Builders' Journal.

Cement Grout Buildings

IN the construction of the many houses, barns, kennels and other buildings on the extensive country estate of Joseph B. Thomas, at Middleburg, Va., cement grout poured in steel forms has been adopted with marked success, both in cost saving and in producing permanent, attractive buildings with unskilled labor and utilizing rough stones cleared from the fields. The plans of this interesting group were prepared by Frederick J. Sterner, architect of New York, and a new system of steel forms, the invention of a Washington architect, Milton Dana Morrill, were employed for the work. Liquid grout of cement, lime and sand was first poured into the steel forms, and into this grout rough field stones of all sizes and shapes were dropped and bedded. The forms were coated with rosin and sand to give rough face and after the forms were removed a thin coat of cement stucco was applied to the walls. As from seven to nine feet in height was poured at one operation, the work was rapidly done. This grout construction is in no way new. The Romans employed it largely in the Coliseum, which for centuries withstood the ravages of time. These walls, of course, were tremendously thick, and the inside and outside faces were first laid up and the middle part poured full of grout afterward. In our own time this construction has been largely used in Southern France, not where wood forms have been employed to receive this grout. These forms must be built water-tight, which has made the cost prohibitive, especially for the lighter forms of construction. Steel forms, however, have been successfully used in the above-mentioned work and the cost per square foot is practically nothing, as these forms are in the nature of a permanent equipment to be used over hundreds of times.

Mr. C. H. Haga, the superintendent of construction for the Thomas Estate, has given the following interesting cost data on these grout walls, which would indicate that this form of construction might be used with considerable saving on foundations and walls generally where there is a scarcity of skilled labor.

On rough stone walls it is difficult to get all stones perfectly bedded in mortar. In the grout walls, this is much easier, as the stones are dropped and immersed in the wet mixture and a smooth finish is left inside and outside. Mr. Haga reports that this grout construction has been used on over 1,000 cubic yards of 12-inch wall, with common labor at 19½ cents per hour. The cost per cubic yard was:

1 yd. field stone	$ .60
¾ yd. sand at $1.50	1.12
300 lbs. cement at $1.50 bbl.	1.12
100 lbs. lime	.48
Mould setting and pouring	.89
Total cost	$4.21

As one cubic yard makes 27 square feet of 12-inch wall, the cost per square foot of finished wall is slightly less than 15½ cents.

This grout construction showed a considerable saving over rough stone walk, which must be laid up at least 18 inches in thickness.

School Competition Law of 1872 Declared Void

THE old California state law of 1872, which required competition for the selection of architects to design public school buildings, will harass the school boards and architects no longer, according to a decision rendered recently by County Counsel A. J. Hill of the District Attorney's office, Los Angeles, in which he held the law to be invalid in that it had been superseded by subsequent statutes passed by the State Legislature. As the county attorney is the legal authority by whose decisions all school boards are governed, the boards of education and boards of school trustees throughout the county will now be free to select their architects in whatsoever manner they choose, the same as they did before the law of 1872 was resurrected after having been ignored for many years.

The decision was rendered to the board of school trustees of the city of Venice, who desired to select an architect to design a $200,000 polytechnic high school for that city without holding an architectural competition. The matter was first taken to the County Superintendent of Schools, Mark Keppel, by whom it was taken up with the county counsel in person. At this time a committee of architects, appointed by the Southern California Chapter, A. I. A., were at work in an endeavor to devise some means of bringing a test case in court and probably carrying the question to the State Supreme Court in order have the old law nullified. They had secured the services of an eminent attorney, Mr. Seward A. Simons, who made a very thorough study of the legal phases of the matter. When it was learned that the Venice School Board had asked the county attorney for a review of the case and a decision on the validity of the law, the architects' committee conceived the idea of combining forces with the school board and asked the county attorney for the privilege of having their attorney, Mr. Simons, submit the results of his research and his arguments in the form of a brief, which request was granted.

While the authorities for declaring the law invalid were few, they were of the best. A similar decision was rendered in December of last year by State Attorney-General U. S. Webb, declaring the law of 1872 repealed by subsequent legislation. Perhaps the best precedent was established only a few weeks ago in a decision, rendered by Judge Wood of the Superior Court of Sacramento county, in which the law was held invalid on the same grounds.

When the problem was submitted to Mr. Hill he gave the matter the utmost consideration, viewing it from all angles and reviewing all authorities and precedents cited and all subsequent acts passed by the Legislature bearing upon the question involved. While almost innumerable instances of conflict were found by Mr. Hill between the law of 1872 and later acts of the Legislature, probably two of the most important sections upon which his decision is based were sections 1617 and 1543 of the Political Code. Under section 1617, subdivision 20, boards of school trustees are granted the power to erect and build school buildings, without limitation, and Mr. Hill maintains that the selection and securing of an architect is merely an incident thereto. Section 1543 provides that boards of school trustees must submit plans for school buildings to the county superintendent of schools for his approval or rejection. Mr. Hill holds, in his opinion, that if the law of 1872 were complied with, an architect chosen, plans prepared and bond furnished, this would constitute a contract with the architect and the county superintendent could not reject the plans. For these and many other legal reasons he has rendered a decision that the law is not in effect.

In view of the precedents now established, all other county attorneys will no doubt concur in this decision and the law of 1872 will be relegated to the

oblivion from which it was resurrected only a year or two ago. It was passed at a time when there were no architects in the meaning of the word today. The old law had served its purpose and had outlived its usefulness years ago. It had become so entirely obsolete that from the very nature of things and from the provisions of the State law governing the practice of architecture now in effect, the terms could not be literally complied with if so desired. It originally applied to State and county buildings, but its application to structures in these classes has been nullified by more recent laws establishing the State Department of Engineering to have charge of State buildings and the county government act which prescribed other requirements for the erection of county buildings. The law now applies to nothing and is null and void.

*
* *

Are Concrete Form Builders Necessarily Carpenters?

WHEN reinforced concrete was a new material it was always a problem to find mechanics trained to handle it. This applied especially to form building, and while we naturally turned to the carpenters' trade to supply our form builders, yet it was always more or less evident that carpentry and form building were essentially two different things. One instance in a small town in Michigan is especially recalled where we were putting up probably the first reinforced concrete work that had gone up in that locality and were using carpenters. It seemed absolutely impossible for even an intelligent carpenter to interpret the blueprints of an ordinary engine foundation. They could not seem to realize that they were not building the foundation, but were building temporary forms only, to contain the foundation. They were constantly sawing boards the wrong length and could not get over the habit of years in handling lumber as in house building and similar structures.

It was found to be much better practice to use only a few carpenters and break in handy men as form builders. Along this line a recent bulletin of the General Contractors' Association, N. Y. C., calls attention to the danger in New York of establishing a prevailing rate of wages, not according to the principles of law laid down by the Appellate Courts, but by resolutions of labor unions and other organizations providing for the payment of certain rates of wages to employes in particular occupations. The different unions of carpenters are complaining that the subway contractors are not paying the prevailing rates of carpenter wages to concrete form builders on the subway work. An investigation is now under way by the New York State Labor Department, and the unions claim that concrete form workers who work in wood are entitled to be classed as carpenters and be paid the prevailing rate of wages for carpenters.

The Bradley Contracting Company, which at present is the particular contractor involved, asserts that these concrete form workers are merely handy laborers and are not entitled to be paid more than $2.50 per day, which is a fair prevailing rate for such service. The labor unions seem to think that the rate should not be determined by the prevailing rate for any class of workmen, but should be what they prescribe.

The entire matter seems to reduce to the question asked in the title—"Are Concrete Form Builders Necessarily Carpenters?" Future developments will be watched with interest.—Cement Age.

Many Uses for Birch are Recorded

FROM furnishing material for a canoe in which to hunt whales some hundred odd years ago to supplying New England factories of today with 11,000 cords of wood annually for shoe pegs and shanks is, according to the Department of Agriculture, only part of the services the birch tree has rendered and is rendering the people of America.

Sir Alexander Mackenzie, the department telis us in a bulletin just issued on the uses of birch, hunted whales in a birch-bark canoe. The animals were found at the mouth of the Mackenzie river. He failed to strike the game, and concluded that it was probably for the best. While the canoes are frail, it is pointed out that the bark of which they are made resists decay longer than any other part of the tree.

It would be difficult, the department goes on to say, to estimate the value of the service of the birch-bark canoe in the discovery, exploration, development and settlement of the northern part of this continent. From the Arctic Circle to the Great Lakes, and southward, for a century and a half, that light but exceedingly strong and serviceable vessel threaded the lakes and rivers, bearing trade and carrying civilization where no other boat could go. The French explorers and missionaries made journeys of hundreds of miles in these canoes, often carrying cargoes which would seem beyond the capacity of such frail vessels.

The range of uses to which birch wood is put is surprisingly large. According to the department, the articles into which it goes range from church pews to kitchen tables, and from organ pipes to newel posts. We may have our first sleep in a birch crib and our last in a birch coffin. The spools on which we get our cotton and silk thread are birch spools, and the lasts on which our shoes are made are likely to be birch lasts. The largest of the spools hold 12,000 yards, the smallest 20 yards. The wood's beauty, strength and rigidity make it prominent as a material for musical instruments, and the same qualities bring it into extensive use for flooring.

Many people have an idea that shoe pegs have nearly passed out of use, but the amount of birch previously mentioned as made into pegs and shanks yearly in New England seems to disprove this notion. Birch, the department says, is often put on the market in imitation of other woods, and we may open many a door, sit on many a chair, and write on many a desk which we imagine to be mahogany, but which is really birch stained to resemble the genuine article.

Nine species of birch grow in the United States, but sweet, yellow, paper and river birch are those most used. About 45,000,000 board feet of the wood finds its way to the market yearly. Paper birch is one of the few American species with a hold on the forest stronger than it had when America was discovered. Large tracts are now covered with this birch where there was little of it a century ago. It comes in after fire, and some tracts it has taken possession of cover hundreds of square miles.

* * *

"Smoke-Proof" Buildings

A FIREMAN of long and varied experience in the service of the New York City Fire Department recently stated that of the bodies recovered from burned buildings, a surprisingly large number showed no visible effect even of being slightly scorched by the flames, which means, of course, that a large proportion of the fatalities are due to simple asphyxiation. In the Park Avenue Hotel fire of some ten years ago, most

of the guests who lost their lives were found, if we remember rightly, without a visible mark of fire upon their persons or clothing.

So far as the fatal effects are concerned, the poisonous gases that accompany smoke are as deadly to human life as flame. Hence, if the lives of the inmates of a tall office building are of greater value than the structure itself, we should take greater pains to protect human life against asphyxiation than we do to protect the steel and masonry building against fire. But to secure both of these results, it is necessary, not merely to construct the building itself of incombustible material, but to see to it that everything of a combustible nature in the way of fittings and furnishings be most rigidly excluded. If the tons of wooden furniture in the lower stories of a 300 or 400-foot high building were ablaze, and the products of combustion, the smoke and gases, were sweeping upward through stairways and elevator shafts and filling the various corridors, what earthly chance would the inmates of the upper stories have of getting out of the building before they were overcome by suffocation?

All of which considerations give great force to the protest which has recently been made by Mr. A. G. Patton, manager of the Special Hazards Department of the New York Fire Insurance Exchange, against the plan of the Board of Estimate to equip our new municipal building with wooden office furniture. We have buildings from 400 to 700 feet and more in height in this city today. They are fireproof; that is to say, incombustible, it is true; but what about their contents?

By all means let the Board of Estimate rescind its action and provide for making our municipal building fireproof not only in itself, but as to its contents.—Scientific American.

* * *

Passing of the "Technical Press"

THE day of popularity of the technical press, if, indeed, that day ever existed, is fast passing away. Even the American Institute must have realized this when it established its own monthly publication— The Journal; an awful blow to the so-called technical fellows. Did you ever notice how they review each other's work every month? Only three or four publications are recognized at all. The rest of us, of course, are not in their class. If The Architect and Engineer, for instance, was to show for the first time one of Cass Gilbert's wonderful office buildings, this coterie of exclusive money-losers would wait till one of their own number could get the work printed—then the whole bunch would scramble to be first with a review. Of course, anybody with any understanding at all of the publishing game knows that a technical press must of necessity possess a very limited circulation. The magazine or paper that confines its pages to strictly technical matter—heavy reading, one might say—cannot expect to have an extensive following. Even members of the profession for whom the matter is intended tire of it. They seldom read the contents. The pictures, printed on one side of the paper, are torn out and filed away —the rest of the book goes into the waste basket—and that reminds us: Where do the advertisers get off?

So the wide-awake architect, who is in sympathy with the Institute's movement for greater publicity, is quick to appreciate the superior value of the semi-technical, semi-trade journal that shows the good with the not so good—the work of the big man with that of the smaller fellow. He wants his work to be seen by somebody other than his brother architects. The latter don't bring him business. Not much.

Some Foreign Sketches in Pencil and Wash

Entrance Detail
Withey & Davis, Inc., Architects

Foreign Sketch
By Charles H. Kysor

Sketch in Amboise, France *Charles H. Biggar*

A Street Scene in Cordova — *Charles H. Bigger*

Naples, a Sketch by Otto N. L...

Foreign Sketches by Charles H. Kysor, Los Angeles

Foreign Sketches by Charles H. Kysor, Los Angeles

On the Prairies—Hoover Art Gallery
By Boird

Water Color Sketch
By W. A. O. Munsell

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Next Convention City—Seattle.

Fine Hospital for State University

Architect Lewis P. Hobart of San Francisco is preparing plans for the University of California hospital to be erected on the affiliated colleges property of the university. The building will represent an expenditure of $600,000, nearly all of which has already been subscribed by private donation. A Class A building, eight stories high, will be erected and construction will start in January.

Architects Elect Officers

The Southern California Chapter, A. I. A., has elected Robert B. Young president for the ensuing year. Albert C. Martin has been elected vice-president and Ferdinand Parmentier and August Wackerbarth succeed themselves as secretary and treasurer. J. J. Blick of Pasadena is the new director for three years.

The meeting opened with a valedictory address from President Austin, in which the spirit of the chapter in the past term was highly commended. Mr. Parmentier then presented the secretary's annual report, which gave a complete account of the work accomplished by the body in the past twelve months. The annual report of the treasurer, Mr. Wackerbarth, was received and acted on favorably by the auditing committee. It showed a substantial increase in the revenue of the chapter. The report of the board of directors was adopted.

The chapter decided to send a booster's committee to the annual convention of the Institute at New Orleans in December to urge the selection of Los Angeles as the convention city in 1915. An attempt will be made to advance the date of the convention so that institute members can include the San Francisco and San Diego expositions on their trip.

Los Angeles A. I. A. Chapter Committees

Robert B. Young, the newly elected president of the Southern California Chapter of the American Institute of Architects, has departed from the usual custom in the appointment of the various committees to assist him in conducting the affairs of the Chapter for the next twelve months. Heretofore it has been customary for the chief executive to appoint all committees in full but Mr. Young has decided to try the innovation of appointing the chairmen only of the various committees, and allowing each chairman to select his own assistants.

The members of the association selected by Mr. Young and the committees over which they will preside, are as follows:

Membership Committee — Frank D. Hudson.

Entertainment Committee—John P. Krempel.

Sub-committee on Public Information—Albert R. Walker.

Sub-committee on Competitions—J. E. Allison.

Permanent Committee on Legislation —J. J. Backus.

Sub-committee on Education—John C. Austin.

Committee on Ethics and Practice—Theo. A. Eisen.

Santa Cruz May Lose Architect

(From the Santa Cruz Sentinel)

William Bray, the architect, has received a flattering offer from the South Nigerian Exploration Company of London, England, in whose employment he served three years before coming to the United States. The position now offered him, which will remain open until March, 1914, is that of superintendent of one of the company's districts in West Africa, which carries with it a salary of £120 or about $600 a month.

Mr. Bray was on the former occasion compelled to resign his position with the Nigerian company on account of ill health caused by the sickly climate of tropical Africa.

Minneapolis Building at San Francisco

(From The Improvement Bulletin)

The suggestion, given publicity by the Evening Journal, that Minneapolis have a building at The Panama-Pacific Exposition is worth careful consideration. The State will not be represented there if some one or more of its cities does not improve the opportunity. The last Legislature let the bill for a building die in committee. In Iowa the city of Waterloo has undertaken to serve its State by providing a building at the Panama-Pacific Exposition. Its patriotic enterprise has attracted much attention and caused many compliments. No need these days to argue for this proposition: It pays to advertise.

Andrew C. Smith

Andrew C. Smith, one of the pioneer architects of Los Angeles, died very suddenly the latter part of October at his ranch near El Monte. Mr. Smith was born in Marietta, Ohio, in 1857, and as far as could be ascertained, he had no living relatives at the time of his death. He came to California in 1888 and for the past eighteen years had maintained an architectural office in Los Angeles. He was at one time senior member of the firm of Smith & Elder, composed of himself and Chas. A. Elder, now president of the Los Angeles Investment Company. Of late years Mr. Smith had specialized in school buildings, of which he had designed a large number throughout Southern California.

State Board of Architecture

As stated briefly in the October Architect and Engineer, Mr. Edgar A. Mathews has been appointed a member of the Northern District Branch of the California State Board of Architecture. The board has granted certificates to practice in California to Warren C. Perry and Albert W. Burgren, both of San Francisco, Mr. Burgren having been associated for a number of years with T. Paterson Ross. He is now practicing alone, with offices in the Holbrook Bldg.

Changes in State Architect's Office

Seven State employees in State Architect McDougall's office at Sacramento were given notice October 1 by State Engineer W. F. McClure that their services would be no longer required after a month. The men so notified are A. R. Widderson, head draughtsman, salary $2400; C. F. Dean, architectural designer, $2400; W. J. Lang, structural draughtsman, $1500; P. B. De Longchamps, draughtsman, $1500; H. E. Stern, draughtsman, $1800; Horace F. Horn and Van S. Stimson, $1320 apiece.

The public reason assigned by McDougall for the action of State Engineer McClure in the discharge of these men is "an alteration in the interests of the efficiency of the office." McDougall claims that no unusual reason exists for letting these men go besides that given.

It is said the discharged men will invoke the aid of the civil service rules in an effort to retain their positions. The act provides that when an employee is discharged the head of the department must furnish him with reasons for dismissal in writing. The employee can then demand that a public trial of those charges be held by the head of the department, at which evidence on each side may be offered.

Since the above was written the Civil Service Commission has informed State Engineer McClure and State Architect McDougall that the seven draughtsmen could not be dismissed without having written charges filed against them. McClure thereupon agreed to rescind the order dismissing the men. They will retain their places.

Residence for Forest Hill

Architect D. C. Coleman, Merchants' National Bank building, San Francisco, has completed plans for a two-story and basement frame and plaster residence to be erected in Forest Hill, San Francisco, for W. J. Nichols of Nichols & Fay, general insurance brokers in the Merchants' Exchange building. The house will cost about $7500.

Poor Scagliola Work

Following a report from Inspector T. D. Jenkins that the new Sacramento court-house contains defects, the Lindgren Construction Company has been given thirty days in which to bring every detail of the building up to specifications. On the advice of the District Attorney, the Supervisors will complete the building independent of the contractors if the work is not finished in thirty days.

According to Jenkins, there are twenty-seven items which are not up to the plans and specifications.

Chief among the defects of the building are the scagliola columns, which have three times been rejected and which will be rejected the fourth time if not put in shape to meet the approval of Architect Herold and Inspector Jenkins.

The Pacific Coast Art Marble Company of San Francisco, sub-contractors, who placed the scagliola columns, were given three weeks by the general contractors to do their work right.

Architect Becomes a Benedict

The wedding of Miss Ruth Pierce of San Francisco and Percy Eisen of Los Angeles took place Thursday, October 16, at St. Stephen's church in San Francisco. The bride is a daughter of Mrs. Fidelity Pierce of San Francisco. The groom is the son of Mr. and Mrs. Theo. Eisen of Los Angeles, and a nephew of Mr. and Mrs. Wm. Curlett. Eisen is associated with his father in the architectural business.

Berkeley Elks Building

Architect W. H. Ratcliff and the Building Committee of Berkeley Lodge of Elks have awarded the contract for the new Elks building in that city to Walter Sorenson, 3219 Ellis street, Berkeley, for about $65,000. This contract includes plumbing, heating and electrical work.

Plans for Berkeley Theater

Architect A. W. Cornelius, Merchants' National Bank building, San Francisco, has completed the working drawings for the construction of a class A theater in Berkeley for the Dahken Moving Picture Syndicate. The building will cost in the neighborhood of $75,000.

Personal

Architect Elmer Grey of Los Angeles is taking an extensive European tour. He will tour France, Belgium, Holland, Germany, Italy and Sicily, the return voyage being through the Mediterranean countries. Mr. Grey will be away for three months.

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Vol. XXXV. Nov., 1913 No. 1

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MUNICIPAL ARCHITECTURE IN OAKLAND

The new Oakland school buildings are attracting the interest of educators and school architects in all parts of the country, and John J. Donovan, architect in charge, is in receipt of numerous inquiries as to when they will be completed and ready for inspection. Several Eastern authorities in school architecture are planning visits to Oakland in order to inspect and study the new structures. Her city hall and auditorium are also receiving a good deal of favorable comment, though some would censure the architect for not giving the city a million-dollar auditorium for half that sum.

Oakland has revolutionized the idea of school buildings, and in place of the old stereotyped frame or brick buildings of two and three stories is erecting buildings which are, in the main, of one story in height, and in place of having a depreciating effect on property in the neighborhood, have had the opposite result.

The general lines of the later Renaissance and northern Italian architecture have been adopted in some of the buildings, but these have been so modified and changed as to produce a distinctive type and one which is admirably suited to the California landscape and climate. Each building is surrounded by large playgrounds and recreation centers for the older children, and patios and cloisters furnish play spaces for the younger.

All class rooms are so arranged that they may easily be thrown into open-air rooms, and in the schools already finished this feature has worked a great benefit to the general health of the pupils, with a consequent betterment in the class work. Statistics on the health improvement are being compiled by the medical department of the Oakland Board of Education.

They may say what they please about Architect Donovan and his "political pull," but the fact remains,

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The constitution and by-laws of the society are substantially those of the American Institute of Architects.

The society has voted not to increase its membership beyond the present number for an indefinite period. When the society decides to withdraw this temporary restriction, then, in accordance with the by-laws, any practicing architect or any architect engaged in architectural education or any architectural draftsman, over thirty years of age, will be admitted to membership if he can submit proofs of his honorable personal and professional standing. The applicant for membership will require the approval of all the members, to be elected.

The society meets on the second Wednesday of each month. The annual meeting takes place in June.

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he is giving Oakland some mighty good architecture—a style that is thoroughly in keeping with the general advancement of the community, and of a type that will last for many years to come.

McADOO, THE REFORMER

Architects and stone-cutters, who were distressed by Secretary McAdoo's recent ban upon Roman numerals to date new federal buildings will have fresh cause for concern in his interdiction of the use of V for U. Historically, of course, they are the same letter. The Phenician alphabet, which ended with T, had neither, but the Greeks represented this vowel by Y and the Romans by V, which was sometimes written in a more or less rounded form. No distinction was made between them, and the same confusion was brought over into English. In many old texts the capitals are "V" and the lower case "u." It is only in comparatively recent times that they have been thought of as distinct letters, and since in many Latin text-books the modern distinction is made, the old usage is sometimes overlooked. There is, as a matter of fact, little danger of confusion, since the context shows whether a vowel or a consonant is called for, but to those not used to the angular "u's" they are a little puzzling at first, like the long "s." Many stone-cutters on artistic grounds prefer the angular form with its straight lines; but Secretary McAdoo has set out to please the "man in the street," whose claims should be strong in the case of buildings that abut the street.

W. H. Weeks Wins Competition

Architect William H. Weeks of San Francisco has had his plans accepted for a new high school building to be erected at Eureka, Humboldt county, California. The structure will cost $110,000 and will be of reinforced concrete. Working plans are being made.

State, County and Municipal Engineering

Good Roads—Water—Sewers —Bridges—Fire Protection

The Mount Diablo Boulevard

By WALTER GRAHAM

CALIFORNIA is the leading State in the Union in the use of automobiles, the actual number of machines being exceeded only by those of New York, while the number in proportion to population is far greater. Automobiles are both a cause and an effect of good roads. Where fine highways abound the motor cars multiply, and every auto owner becomes a good roads enthusiast. California's eighteen million dollar bond issue is resulting in some fine highways, running the length of the State; the counties and municipalities are active road builders, and various private interests are constructing magnificent drives.

A Characteristic Bit of Scenery

The number of automobiles carried on the ferries crossing San Francisco bay is astonishing. Every morning they pour out of the city on various errands of business and pleasure, and on Sundays and holidays they constitute a greater army than the thousand chariots of Pharaoh.

Of the many thoroughfares leading out into the green hills beyond the bay cities, none is more interesting than the tunnel road, running northeast from Oakland. Emerging from the tunnel one comes at once into a fairyland of mountain and valley, beautiful roadside nooks and shimmering blue and pearl-gray vistas, with cloud-capped Mount Diablo dominating all. Here, within a ride of an hour or two from San Francisco, lies some of the most picturesque and interesting country to be found in America. The road rises, with no precipitous grades, nineteen miles to the top of the mountain, whence is to be had a view comparable to that of the Italian Alps, extending over the Sacramento, San Joaquin, Santa Clara, San Ramon and Napa valleys, the San Francisco bay region, the Golden Gate, and far away over the blue Pacific, beyond the Farallones. Three hundred miles to the north, Mount Shasta rears its hoary, majestic head. In a clear atmosphere, a half of the Conquistadores' Land of Gold lies beneath the eyes of a gazer at the summit of Diablo.

This whole region was but a few years ago held by a few vast estates, a thinly peopled and half wild country, within cannon shot of the metropolis of the Pacific Coast. But the building of the

Ingot Iron Culvert

Oakland & Antioch Electric Railway and of the fine new highways by the county and the development companies is rapidly changing all this. An excellent express service is bringing the region to the very doors of the city, and it is becoming an important source of supply for fruits and vegetables. The R. N. Burgess Company is rapidly dividing the great demesne into small holdings, and making another typical California region of homes. This company is a road builder on a great scale, and is now completing a notable piece of highway engineering in the Mount Diablo boulevard.

This road will eventually complete an unbroken thoroughfare for carriages and automobiles from Oakland to the summit of the mountain. It will have a minimum width of twenty-six feet, with extra space at all turns where good views are afforded. The outer edge has been banked all the way to a height of three feet to afford a greater protection. The road is well drained, ingot iron culverts having been installed at all intersecting water courses, and it will be as accessible in winter as in summer. A model 40 Marion shovel, mounted on traction wheels and supplemented with a large crew with scrapers and graders, effectively handles the work of excavating and filling, while a portable stone crusher supplies the materials for a modern road surface. Where the rock is accessible at near-by points, or where, as in this instance, it forms a portion of the excavated material, a portable crusher tends directly to both economy and efficiency. The work as a whole is a permanent addition to the resources of the State.

"See America first" is the slogan of a progressive and patriotic movement. See the wonders and beauties of California is an injunction in full force and effect for all the denizens of the Sunset Coast. Within a day's easy journey to and from the cities of the bay are some of the magnificent scenes of the new world; and by no means least among these is that of the Mountain of the Devil. It is surely a land the mastery of which would be a prize worthy to be offered by the Tempter of Souls.

Twentieth Century Pioneering

Unprofitable Operation of Waterworks by California Municipalities

An interesting series of articles on the economics of municipal ownership appeared in the San Francisco Chronicle during 1912. The articles have been reprinted in pamphlet form, under the title of a "Report of an Investigation of Municipal Ownership in California," by Charles Remington.

Although not written with the intention of advocating State regulation of municipally-owned utilities by a State public service commission, these articles form one of the best arguments that we have yet seen in favor of such regulation. Mr. Remington discovered the laxest sort of accounting in most of the cities—often no real accounting at all. Frequently a city that had been widely acclaimed as having operated a waterworks at a profit was found actually to have suffered a heavy deficit. Absence of depreciation annuities, and failure to calculate interest on the investment were almost universal errors. Operating expenses were frequently covered up in various ways. In addition, taxes were never charged, and rentals seldom appeared as an expense.

Clearly the State of California should follow the precedent of Wisconsin and give its Railroad Commission full control over the accounts and rates of all municipally-operated utilities.

The State Controller of California was empowered in 1911 to require annual reports of the financial transactions of municipalities and counties. From the report for 1911, Mr. Remington deduced the following significant facts as to the municipal operation of fifty-four water systems having an aggregate value of about $35,000,000:

Income:		
1.	Water sales	$1,988,499
2.	Miscellaneous	154,278
3.	Credit for public service (estimated at 10% of above)	214,278
	Total income and credit	$2,357,055
Expense and Fixed Charges:		
1.	Operating expense	$ 726,094
2.	Water purchased	93,142
3.	Maintenance	653,569
4.	Depreciation (estimated at 1½%)	525,000
5.	Taxes (estimated at ¾%)	262,500
6.	Interest (estimated at 5%)	1,650,000
	Total expense and fixed charges	$3,910,305
	Deficit	1,553,250

(Note—It seems likely that item 4 duplicates, in part, item 3.)

To wipe out this large deficit, it would be necessary to increase the rates for water fully fifty per cent.

Mr. Remington personally investigated the accounts of fourteen municipal water systems and five electric systems in central and northern California. All of these, except two, showed a deficit when properly analyzed for a period of years. His analyses of income and expenses, as given for each of these cities, are illuminating and deserve study by those who are interested in problems of social efficiency.

Federal Co-operation for Good Roads

Secretary Houston of the Department of Agriculture says that the State and Federal governments should work together for highway improvement in order that a large proportion of the money annually spent for road construction may not be wasted.

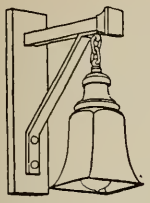
In his own department the office of public roads has been demonstrating the value of proper road building by the construction of certain object-lesson roads, and the forest service is carrying out his idea of national and State co-operation in road building. The law requires that ten per cent of the gross receipts from the national forests shall be spent in the States in which the forests are situated. This money is expended for road improvement under direct control of the Secretary of Agriculture.

The amount appropriated under this act, based on the receipts of the national forests for the fiscal year ending June 30, 1913, is $234,638.68. From the 1912 receipts for this ten per cent road item, there is an additional $134,831.10, which is still available.

In administering the ten per cent road fund, forest officers charged with the actual plans and expenditures in the neighborhood of their forests have, in almost all cases, secured an equal or a larger co-operative fund from State authorities for the building of certain pieces of road.

With the money thus expended many important roads are being built or put in repair. One on the Wyoming national forest, six miles long, makes accessible to farmers a large body of timber and opens up a region of great scenic beauty. In northwestern Arizona part of the fund will be used in connection with the LeFevre-Bright Angel road, important because it makes accessible to tourists the Grand Canyon of the Colorado. In one place, the ocean-to-ocean highway crosses the Apache national forest, Arizona, and on this project the forest service and the local authorities co-operated enthusiastically. On the Florida national forest in western Florida steel bridges and graded roads have, under the stimulus of this fund, taken the place of corduroy, bog and sand.

This Federal road fund is now available in all national forest States of the West. Just as fast as returns come in, the forestry officials say, a similar fund will become available in States in which Eastern national forests are being secured.



Heating and Lighting

Plumbing and Electrical Work

Warm-Air Furnace Capacities and Pipe Sizes

A FEW years ago when rules for determining furnace capacity and pipe sizes for heating rooms with warm air were fewer and less well understood than at the present time, I began early to collect different rules and compare them with the results obtained in my practice, says a writer in a recent issue of the Metal Worker. At this season of the year many men are desirous of having something to refresh their memory as to what is the right thing to do in designing furnace heating systems, so I am giving something for their benefit from my scrapbook.

Capacity of Furnace

The capacity of a furnace can be determined by calculating the open space through which the air can rise in passing through the furnace at the point where there is least opening. The area of this space in square inches will be the area of the warm-air pipes which the air will fill and will be the area of the cold-air supply which should be used in connection with it. No more air can get into the furnace than can pass through this space and it is apparent that no more air can get out of it than the amount that gets in. While the expansion of the air by heating it is not overlooked, it stands to reason that the space referred to must control the amount of expanded air passing into the warm-air ducts. So far as the warm air is concerned, it is possible that in many instances with furnaces of cheap construction, little fire travel and small heating surface, this open space will be larger than in better constructed furnaces, and consequently the area of the warm-air pipes which such furnaces will supply should be reduced 25 to 40 per cent.

To give some better guide to the beginner, I would say that the capacity of a furnace of good construction having a deep fire-pot, a combustion chamber over it, and above that a dome into which the smoke rises and then passes through an opening at one side or the other into a circular radiator around which it has to pass before it escapes to the chimney, may be reckoned in accordance with the accompanying table:

Table of Furnace Capacities

Diameter of fire-pot, in.	Diameter of casings, in.	Area of warm-air pipes, sq. in.
17	36	200
19	40	300
22	44	350
25	48	450
27	52	550
30	55	700
32	60	900
34	65	1012

If pipes are small and there are several of them, the furnace is more likely to fill them all full than if there are a few pipes and they are of large diameter. One large pipe directly over the top of the furnace, as it might be set in a church or other building, could be cut from one-half to one-third of the area given. The furnace should have a fire-pot of sufficient depth to carry a good body of fuel.

Furnaces constructed to expose a large amount of surface by different means and to give a longer fire travel will do their work more economically and with less forcing. Many men depend on the manufacturer's rating to get at the capacity of the furnaces and do not enter into any computations for themselves or make comparisons of the merits of different constructions to give different ratings to different furnaces of the same diameter of casing or fire-pot. This is not the best way to become a thoroughly competent furnaceman.

Determining Warm-Air Pipe Sizes

There is just as much need of care in understanding the different rules for determining the right size for the warm-air pipe and in applying the rules to the conditions to be met. Some men compute the contents of the room to be heated and divide it by 25 or 30 for first-floor rooms and by 30 or 35 for second-floor rooms, regardless of its location, the length of the warm-air pipe from the furnace to the register or riser, or the exposure to the north, south, east

or west, as the case may be. The result is the area of the warm-air pipe to be used.

Many men do not realize that the amount of wall and glass surface exposed in a room exerts a more positive bearing on the needs than does the mere cubic contents alone. A room with two or three sides exposed will cool much more air and consequently require much more warm air brought into it than a room which has three sides enclosed by other rooms and but one side exposed to the outdoor atmosphere.

Rules Which Will Be Found Useful

One rule which I have found in an old catalogue is to divide the contents of a room on the first floor having two sides exposed by 20, with one side exposed by 25; for second-floor rooms with two sides exposed divide by 30, and with one side exposed, by 35; for the third floor, divide by 38, which will give the area of the warm-air pipe, and the nearest size pipe to that actually required should be used, and if the room has a northern or western exposure, a larger size pipe should he used by all means. Some men add ten per cent for north and west rooms.

Another rule is to give one square foot of pipe area for every square foot of glass; one square inch for every ten square feet of outside wall and one square inch for every 100 cubic feet of space. For second-floor rooms pipes may have twenty per cent less area and for third-floor rooms thirty per cent less area. Those which are exposed to the north and west winds would have a ten per cent increase in area over those running to the south and east rooms.

When it is necessary to run the piping horizontally more than fifteen feet or there is occasion to make several elbows in it in order to reach the registers, the size of the pipe should be increased at least one size.

Sprinklers and Fire Departments

Every building with a sprinkler equipment should and usually does have a steamer connection to the supply system of the automatic sprinkler equipment. It is generally conceded by fire chiefs that it is a great advantage to connect a steamer to the sprinkler equipment in case of a fire, and keep the sprinkler system supplied in any case where there is liability of the usual sources of supply becoming exhausted or incapacitated by the fire.

The most astonishing occurrence took place at a recent fire in Milwaukee, as reported by the Journal of Commerce, at a fire in the buildings and plant of the Cream City Bedding Company. A portion of the plant was equipped with automatic sprinklers, the water supply coming from an adjoining establishment and the city mains. The fire pump was operated until the water supply was so reduced that the owner of the pump refused to operate it further, and upon the arrival of the first of the apparatus on the scene, the assistant fire chief in charge refused to connect a steamer to the sprinkler equipment. Later, however, upon the arrival of the acting chief, a steamer was connected to the sprinklers, but by that time the fire had got beyond control and a heavy loss resulted. According to an inspector of the Milwaukee Board of Fire Underwriters, the refusal of the assistant chief who first arrived at the fire to supply the sprinkler system was the cause of the spreading of the fire and the greatness of the loss, which totaled about $90,000.

Berkeley Has City Architect

C. W. Ratcliff, First National Bank building, Berkeley, has been appointed City Architect of that city. His first official duties will be the preparation of plans for five fire houses to be erected in various parts of the city. The first building for which plans will be made will be a two-story reinforced concrete or brick central station to be erected on Durant street and to cost in the neighborhood of $30,000. Mr. Ratcliff states that bids for this building will be called for inside of thirty days. Mr. Ratcliff will receive six per cent commission for his work.

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State Laws That Contractors Should Bear in Mind

The haling into court of six Los Angeles contractors charged with the violation of State laws for the protection of workmen ought to serve as a sufficient reminder to all others that there exist certain laws which, if they are not strictly observed, may result in loss of time, in expense and in probable fine, for the average workman of today is on the watch for anything that might indicate that his employer is negligent or not duly respectful of the rights of the employees. Even though the violation of these laws may be more technical than really dangerous to the safety of the workmen, the contractor should take no chances.

Four or five of the charges which took the contractors into court arose from a lack of observance of the scaffolding law passed by the last Legislature, which prescribes the method in which the scaffolding must be hung or erected to guarantee proper safety.

Another contractor was charged with not providing proper flooring underneath upper stories on which workmen were at work.

Still another State law is in regard to the number of persons that may be allowed to sleep in one room and is enforcible by the health authorities. This law, which has been on the statute books for several years, and which primarily applies to lodging houses and tenements, is also found enforcible in respect to bunk houses of construction camps, established anywhere throughout the State.

Plans Approved for State Work

The State Engineering Advisory Board has approved plans for improvements totaling $90,400 at nine different State institutions. In the prospective improvements are $17,500 for a boys' dormitory at Sonoma State Home, and $2,685 for restoration of Sonoma Mission.

The work approved includes: Berkeley Deaf and Blind Home, fire escapes, $6500; Los Angeles Normal School, grandstand $2300, clock and bell system $3200, telephone system $3000; Napa Hospital, laundry, $18,000; San Francisco Normal, painting, $1900; San Jose Normal School, manual training building $3600, gymnasium $3750; Yountville Veterans' Home, improvements to building $2550, repairs to dining hall $6637; San Quentin Prison, guards' cottage $11,000, windows cell building $1701, plumbing $1824; Folsom Prison, dairy barn, $5900.

Unloading part of a 5,000 yard (equal to 200 car loads) order of washed gravel with clamshell bucket at Bolinas Bay for the J. G. White Engineering Corporation

This photograph shows two of the Pratt Building Material Company's barges (C. F. Pratt, president) unloading washed gravel at Bolinas Bay for the J. G. White Engineering Corporation, who are building two wireless stations for the Marconi Wireless Telegraph Company, one at Bolinas Bay and the other at Marshalls on Tomales Bay. Each of these stations will cost $250,000 and consist of an operators' building, 50 by 80 feet, two six-room bungalows, a three-story modern hotel to accommodate fifty people, power house, six steel towers, each 350 feet high, etc., all made of reinforced concrete.

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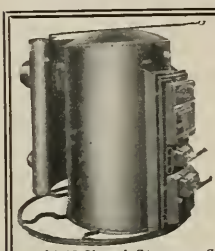

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Picture Theater Still Conquers

(From the Improvement Bulletin, Minneapolis)

Theaters have interested the race for many centuries but not by any manner of means so vastly as now. The great open-air theaters of ancient days in sunny lands were built with an idea of giving almost the entire population of one community a chance to sit down together. The Coliseum was a notable effort to accommodate a cityful. Nowadays the theater seems to be breaking up into small parts, each part trying to get as near the home and fireside of the citizen as possible. It lurks around the corner; it meets him on the way to the drug store to get a cigar; it flirts with him on the way home from the barber shop. So we have the enormously increased number of theaters still increasing. New enterprises of this nature are especially numerous in Minneapolis and St. Paul, both, but the citizens of the capital city seem to develop a capitalist who will attempt the moving picture route to profit with more frequency than Minneapolis. It was recorded in a recent issue of the Improvement Bulletin that St. Paul was ahead of New York City in the number of theaters to population, having one to each six thousand people while New York had one to every seven thousand. Minneapolis has issued sixty-seven theater licenses for all classes of amusement structures. This number, using 325,000 as the population, would indicate almost one theater to five thousand. But not all of the theaters licensed are running. Here, as in other cities, the birth rate must be set against the death rate, with the result that the increase is seen to be not so rapid as it appears. Out of the large number of small theaters will come a smaller number of large local theaters, of good, special, permanent construction, as in Chicago. These should give the architect, the contractor, the decorator and the material men good opportunities.

The Ventilation of Cellars

A cool place should never be ventilated unless the air admitted is cooler than the air within, or at least as cool as that, or a very little warmer. The warmer the air, the more moisture it holds in suspension. Necessarily, the cooler the air the more this moisture is condensed and precipitated.

When a cool cellar is aired on a warm day the entering air, being in motion, appears cool; but, as it fills the cellar, the cooler air with which it becomes mixed chills it, the moisture is condensed, and dew is deposited on the cold walls, and may often be seen running down them in streams. Then the cellar is damp and soon becomes moldy.

To avoid this, the windows should only be opened at night, and late—the last thing before retiring. There is no need to fear that the night air is unhealthful; it is as pure as the air of midday, and is really drier. The cool air enters the apartment during the night and circulates through it.

The windows should be closed before sunrise in the morning, and kept closed and shaded through the day. If the air of the cellar is damp, it may be thoroughly dried by placing in it a peck of fresh lime in an open box. A peck of lime will absorb about seven pounds, or more than three quarts of water, and in this way a cellar or milk room may soon be dried, even in the hottest weather.

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Concrete Bridges, Roads and Curbs

"Concrete Bridges, Roads and Curbs," issued by the Trussed Concrete Steel Co., Detroit, Mich., has just reached the desk of the editor. The booklet contains 52 pages and is replete with designing data, amply illustrated. The use of the company's expansion joint protector for concrete roads and the steel edge protector for concrete curbs is explained, and in addition to the thorough treatment of the subjects of concrete bridges and culverts, concrete sewers, retaining walls and docks are taken up as well. Particular attention is given the discussion of the design of reinforced concrete bridges for both highways and railroads; also complete tables of designs for flat highway bridges, for girder highway bridges, 16 foot and 20 foot roadways, for railroad box culverts, for highway arch bridges, etc. The illustrations show all types of designs for girders and arches of small and large spans for country uses and for large viaducts, as well as culverts, sewers and retaining walls. The latter part of the book is devoted to concrete roads and protection of the expansion joints in them with Trus-Con Armor Plates. Also the new Trus-Con Curb Bar is shown with its various applications as a concrete edge protector, particularly for concrete curbs. This bulletin will be sent to interested parties upon request to the Improvement Equipment Company, 60 Wall street, New York.

School Building Successfully Moved

After a journey of approximately 1600 feet across lots and down Van Ness avenue to the new site selected for it, the San Francisco High School of Commerce building, moved from its location in the civic center to Franklin and Fell streets, is at the very edge of the foundation constructed for it on the new lot. One more tug of sixty feet and the 8000-ton mass of brick and steel will have completed the most remarkable trip of its sort known to modern engineering.

According to J. M. Nichols of the Sound Construction Company, which has the contract for moving the structure, the school suffered but little during its removal. Nichols declares that an inspection of the interior of the building brought to light but one or two cracks in a single partition, and that $100 would easily pay the cost of repairing whatever damage has been done the school.

"Now," said the architect, who was putting the finishing touches upon Mr. Nurich's residence, "what color do you prefer for the parlor decorations?"

"Oh! they've got to be red," replied Nurich. "My wife's got a red plush photograph album that always sets on the parlor table."

FACTS ABOUT THE "BIG DITCH"

Cost—$375,000,000.

Length—Forty-two and one-half miles.

Dirt excavated—242,000,000 cubic yards.

Channel—300 to 1000 feet wide; from 41 to 619 feet deep.

Locks—1100 feet long and 110 feet wide, usable.

Water summit—Eighty-five feet above sea level.

Passage will require ten to twelve hours.

Isthmian Canal Commission, chairman and chief engineer—Col. George W. Goethals; engineers, Col. H. F. Hodges, H. H. Rosseau, Lieut.-Col. D. D. Gaillard, Lieut.-Col. William L. Sibert; sanitary officer, Col. W. C. Georgas; civil administrator, Maurice H. Thatcher.

Gatun Dam—Length along crest, 8000 feet including spillway; greatest width, 2100 feet; crest of dam, 115 feet above sea level, leaving a thirty-foot margin above the normal height of canal; crest, 100 feet wide; concrete in Gatun locks, 20,000,000 yards.

Cost includes $20,053,000 for sanitation, $7,382,000 for civil administration and $50,000,000 paid to the new French Canal Company and to the Republic of Panama for property and franchises.

Earlier attempts to build: Spain authorized canal in 1814. United States government made first survey of possibilities in 1824, but did not act. Accessory Transit Company, an American concern, began operation of railroad in 1852, but did not use its canal franchise.

Actual construction of canal begun in 1882 by French company of speculators and promoters, headed by Count Ferdinand de Lesseps, builder of Suez Canal. Wild financiering and inefficiency and extravagance put company into hands of receiver in 1889. Under receiver's directions, new company was formed in 1893; it was offered $40,000,000 for canal rights. Deal with America concluded after Panama-United States treaty in 1904. Work on present canal begun May 4, 1904.

Move to More Central Quarters

Messrs. Bill & Jacobsen, who handle the Bradshaw Sanitary Garbage Chute and the Atwood Vacuum Cleaner, have moved their offices and salesroom from 524 Pine street to the third floor of the Rialto Building, San Francisco. The telephone number is Kearny 1601. The new quarters are not only larger but much more centrally located.

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By the Way

Some Industrial Information Worth the While

An Attractive Hardware Pamphlet

In keeping with the artistic features present in the "Russwin" hardware is a pamphlet recently issued by Russell & Erwin Mfg. Co., New Britain, Conn., that illustrates and describes the special lines of hardware made by this company, to accompany various period styles of architecture. Architects will appreciate the efforts of manufacturers to provide details that will enable them to conserve all the propriety of their designs. Inspection of this pamphlet indicates the very thoughtful care that has been given to each piece; none appears to have been too small to have felt the refining hand of good design.

The book, attractively gotten out in color, with a well written text on the different periods represented, while prepared primarily to sell, will be forwarded to architects on application, without charge. It will be found a very useful and helpful guide in the selection of these important details in the interior decorative treatment of the modern building.

A New Shingle

There has been a demand by property owners everywhere for a shingle having all the good qualities of the best wooden shingles and none of their defects.

In many cities the fire regulations exclude the use of wooden shingles, so that a good prepared shingle, which looks like shingles, which is laid like shingles, will last about the same, and gives fire protection, is almost a necessity. Having been in the high-grade roofing business for over a quarter of a century, Bird & Son, makers of the famous "Neponset" roofings, and other building products, have been developing, during the past few years, a remarkable shingle which they have called "The Neponset Shingle."

It is made from Neponset Roofing, but is not by any means merely a piece of ready roofing. Each shingle is carefully built so that it is thick at one end and thin at the other, and on a roof lies just like a wooden shingle.

Each shingle is of uniform size, 12¾ inches long by 8 inches wide, and the

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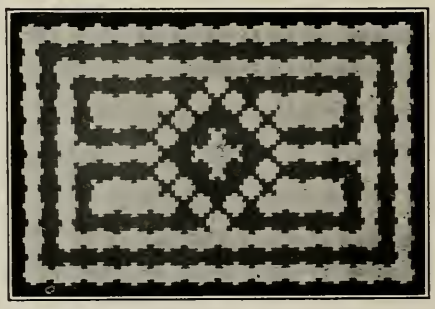
INTERLOCKING RUBBER TILING



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slot is cut in each shingle so as to give a decided shingle effect on the roof. A striking feature about these shingles is that only 452 are required to cover 100 square feet of surface, and on account of this fact, these can be laid more quickly than wooden shingles. There is no waste of time in trimming and fitting as they are of uniform size.

The durability of Neponset shingles is guaranteed by the service given by Neponset Paroid Roofing for over fifteen years.

Samples and further particulars may be had by writing to Bird & Son, East Walpole, Mass.

Make Green Brick

For a long time brick makers have been trying to work into their patterns a green brick, one that will stay green and not "go green," but have met with failure. Recently G. W. Bostwick of the Sacramento Sandstone Brick Company hit upon a process that will produce a green shade. While practically every other color had been possible in brick making, up to that time, green has defied the science of the chemist and the ingenuity of the inventor till the manager of the California company turned the trick. Many brick, both clay and composition, have "gone green in the wall," but this new brick has been found to stand every test to which it has been subjected, both acid and bleaching. Now that a green brick is assured, architects will have one more color to work into wall designs.

Claim Contractors Slighted Specifications

The Sacramento City Commission is going after the Thompson-Starrett Company, which built the City Hall, in an effort to get it to supply a $1100 unit in the building's heating plant, called for in the contract, but omitted when the building was turned over to the city. The man who inspected the building while it was in course of construction failed to detect the omission, which made the heating capacity of the plant an eighth less than it should have been.

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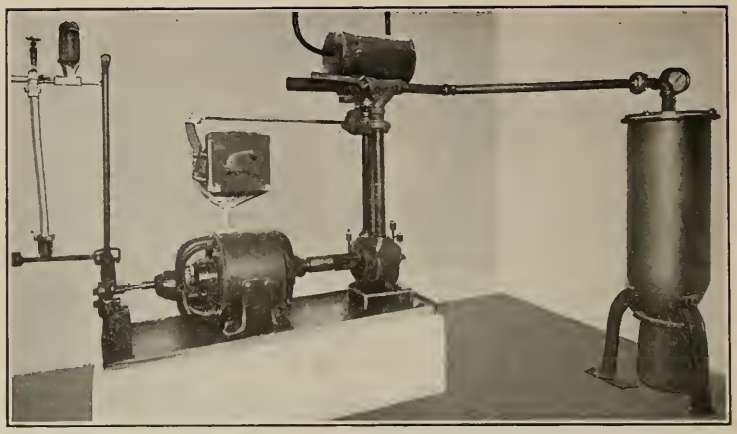

Combination Jarvis Oil Burner and Vacuum Sweeper

The Jarvis Oil Burner

The large demand for the Jarvis Oil Burner for use in hotels, cafes and restaurants has called special attention to this Pacific Coast invention. The simplicity of the machine and the economical way in which it can be operated commend it to the stewards and chefs who have had previous experience with unsatisfactory oil-burning systems. A list of installations would read like a "Directory of Leading Hotels and Restaurants," and as our space is limited, we can refer to but a few:

San Francisco:

Cliff House	St. Germain Restaurant
St. Francis Hotel	Poodle Dog Restaurant
Manx Hotel	Portola Louvre Res't.
Bellevue Hotel	Golden Pheasant Res't.
Jefferson Hotel	Pig & Whistle Res't.
Techau Tavern	Hof Brau Restaurant
Jules Cafe	Colby & Reid Cafeteria
Bohemian Club	Boos Bros. Cafeteria

Sequoia Hotel, Redwood City
Hotel Oakland, Oakland

Besides the hotels and restaurants, leading buildings, such as the Monadnock, Metropolitan Life, Western Union and Humboldt Bank, large apartment houses like the Pierce, Marquette, Riverside, Glenarm, Hampton Court, King Edward, St. Dunstan and Vista Grande, many prominent factories, schools, laundries, hospitals and other institutions, besides coast steamers "Bear," "Beaver," "Rose City," "Sonoma," "Yale" and "Harvard," all use the Jarvis Burners (which are adapted to all kinds of heaters and boilers) and the owners are loud in their praises. The following is a sample testimonial:

San Francisco, Cal., June 24, 1913.

T. P. Jarvis Crude Oil Burner Co.,
San Francisco, Calif.

Gentlemen: The two oil-burning outfits you installed in the Pierce Apartments, northwest and northeast corners of Pierce and Oak streets, nearly two years ago, have, and are giving entire satisfaction from every standpoint. Being operated by ordinary help, are proving very economical in the consumption of fuel and practically no repairs. We have no smoke or trouble of any kind with them. You may not remember, but we have four burners; one under a 35-horsepower steam boiler, one under a 30-horsepower steam boiler, and two under two 10-horsepower boilers for hot water supply. Supplying 104 apartments and 22 flats with steam heat and hot water. The flats farthest away being about 500 feet from the boilers and we have no trouble in supplying them.

Would be pleased to show plants to any one interested.

Very truly,
(Signed) F. H. GRIFFIN,
Mgr. for M. Fisher Co.

T. P. Jarvis has also invented and his company are making a combination Vacuum Sweeper and Oil Burning Set, this being the first of its kind known to the engineering world. It is a system that does the work of oil burning and vacuum cleaning and is made in all sizes and in the gear driven, direct connected and belt driven types.

The T. P. Jarvis Combination Vacuum Sweeper and Oil Burner in simplicity and compactness is unequaled, and requires but a small amount of space in the furnace room. Its first economy to the owner is an appealing one, inasmuch as this installation requires but one motor and is used for oil burning and vacuum cleaning. One pump operates both systems, which is also a great economical consideration. In this plant a saving can be made from $200 to $600 by eliminating the extra vacuum sweep-

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er. This type of machine is absolutely noiseless and is made to stand wear. It has but three bearings to oil and requires no experienced engineer to operate same.

This combination set may be seen in operation at the Glenarm Apartments, Sutter and Polk streets, San Francisco; Adams building, Sutter and Kearny streets, San Francisco; Temple Court Apartments, Turk and Franklin streets, San Francisco; Mon Ming Hotel, Clay and Stockton streets, San Francisco; Hayward High School, Hayward, Cal.; Weber Grammar School, Stockton, Cal.; Hjul Apartment House, Post and Larkin streets, San Francisco; Ellis Hotel, Ellis and Leavenworth streets, San Francisco.

The Jarvis Co. is represented in Alameda county by Mr. Ira I. Hodes of 1415 Milvia street, Berkeley.

Architects, engineers, builders and owners are requested to write the T. P. Jarvis Crude Oil Burner Company, 275 Connecticut street, San Francisco, for particulars, including cost of burners and installation. The Jarvis burners are also installed in apartment houses and residences for both heating and range work.

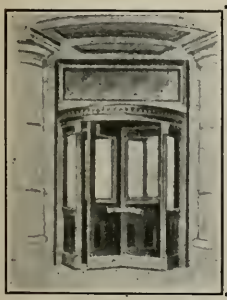
The Lowrie Wall Safe

The San Francisco agency of this fixture, so desirable for up-to-date apartment houses, has been placed with C. Rowan Company, who have just taken possession of their new ground-floor showrooms and offices at 173 Jessie street (opposite the Builders' Exchange). A few of the large installations of the Lowrie safes may be mentioned: Bryson apts., Los Angeles, 90 safes; Esplanade apts., Baltimore, Md., 72 safes; Algonquin apts., Baltimore, Md., 40 safes; Three Fields apts., Boston, Mass., 90 safes; Winchester apts., Boston, Mass., 72 safes; Brooklyn apts., New York, 72 safes; St. Valier apts., New York, 66 safes; Astor Court, New York, 48 safes; The Adlon, New York, 87 safes; Creyton Court, New York, 66 safes; Placid Hall, New York, 42 safes; Herodian Court, New York, 54 safes; Lenox Avenue apts., New York, 48 safes; West End apts., New York, 60 safes.

Hundreds of other installations (many of them on the Pacific Coast) are given in a list recently published, which, together with other literature about the Lowrie safes, will be sent free on application to C. Rowan Company.

"Quantities"

As a writer in the September Architect and Engineer expressed it, "Incorrect quantities are largely responsible for inaccurate bids." The European



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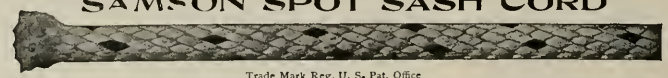

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Satisfaction Guaranteed ROBERTSON & HALL, Managers No Red Tape

countries have their "Quantities Surveyors" and to meet the same need and fill about the same field here, Crossett & Eastman have organized a new bureau, where a force of competent estimators will guarantee perfect quantities to the contractor besides reducing his expense of estimating and giving him his figures in the quickest possible time. This bureau is called The C. & E. Estimating Bureau, with offices in the Hearst Building, San Francisco. The list is still open for contractors who wish to avail themselves of the bureau's experience and facilities.

Eleventh Edition Hy-Rib Hand Book

The Trussed Concrete Steel Company of Detroit, Mich., has just published the eleventh edition of the Hy-Rib Hand Book, a very complete treatise on the subject with many additions over previous issues.

The new Seven-Rib Hy-Rib is shown throughout the book, including new tables of carrying capacities and tables for use in walls, partitions, ceilings, etc. Specifications have been completely revised to provide for this new material, the Seven-Rib Hy-Rib replacing the Four-Rib Hy-Rib. The sheets are twenty-four inches wide and the ribs fifteen-sixteenths inches deep, saving time and labor in construction and providing increased rigidity.

Many new interesting applications of the Hy-Rib are shown; such, for instance, as the Hy-Rib dome for the Presidential palace of the Cuban Government at Havana, a very important construction. Also the large Hy-Rib concrete culvert for the Carnegie Coal Company, and also the passageway at the Wayne County Home and many other new illustrations.

The book will be mailed free to all interested in building.

Biturine Enamel for Water Tanks

A new departure has just come to notice in regard to tanks used on various large buildings, in the treatment both inside and out with Biturine, particularly the inside with Biturine Enamel, which is the interesting thing and the new feature.

In our various office buildings, hotels and where there are large public halls, the water stands in the tanks for long periods of time and the life common to such conditions breeds, rendering the water foul and unfit for washing, not to speak of drinking. Aboard ship, where water is transported thousands of miles, this is a very essential point, and for years Biturine has been used on the inside of such tanks. It does not affect the water, either to make it taste or smell, the material itself being of a wholly antiseptic nature, hence the adoption of this material on the tanks of the Kahn building in Oakland, the McKenzie building on Van Ness avenue, the filters of the Pacific-Union Club, the tanks of the Flood building. In addition to the sanitary feature, Biturine is very economical in that it is permanent and tanks so treated do not have to be coated for a number of years. This is a very simple and practical way of handling a very vital subject.

No Limit to Herold's Commissions

(From the Sacramento Union)

Evidently believing that the firm of W. and J. Sloane & Company is trying to avoid filling the contract recently made with the county to furnish battleship linoleum for the county courthouse, the Board of Supervisors has declined to grant the request of a representative of the firm that brown be substituted for green, in the color scheme of the proposed floor covering. The firm must fill the contract, or be held by its bonds.

The cost of the linoleum will be, according to the award made by the supervisors, $6617.45—of which Architect Rudolph A. Herold will receive ten per cent. Not only will Herold receive ten per cent of that sum for services in "designing" the linoleum, but he will receive ten per cent for the awnings to be placed on all windows of the I street

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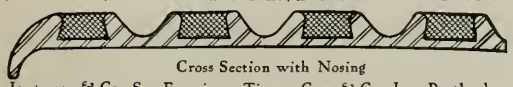

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Nelson Martin, San Diego
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palace of justice within a few days by a local contractor, at a cost of $1360.

He will receive the fee for "designing" the awnings, although it is said that when completed and ready for acceptance by the supervisors, they will not be unlike hundreds of other awnings on business houses of the city, for which no fee was paid for architect's designs.

The architect who designed the courthouse will also receive ten per cent for "designing" the shades to be placed on windows of the courthouse by the John Breuner Company, at a cost of $1090. The firm has been installing window shades for many years, and has placed them on many big buildings, and no fee was paid to an architect for "designing." It is said at the courthouse that the shades will be the same sort as installed in other buildings.

Inducements to Plastergon Wall Board Dealers

The Plastergon people have inaugurated the policy of giving exclusive representation in any territory to the dealer or builder who will push the sale of the product, thereby protecting the representative against the danger of having the results of his energetic work in behalf of "Plastergon" shared by a competitor after he has built up a profitable business. The company also co-operates with the builder who represents it by an energetic campaign of advertising over the representative's name, thereby enabling him to become really a distributor, bringing the orders to his door to be filled. As a result of this policy the company has secured the co-operation of a vast number of builders and dealers in all parts of the country, but there is still much territory open for energetic and up-to-date builders and dealers. Any carpenter or builder who is interested in adding to his business a line which is likely to result in his securing profitable jobs in his neighborhood can secure samples and prices of "Plastergon," together with the exclusive agency proposition, by writing to the Plastergon Wall Board Company, Dept A, North Tonawanda, N. Y. Through this proposition he may not only place himself on an equal footing with his competitor in introducing to his customer one of the latest products for interior construction and decoration, but he may control for himself the entire business in his territory for a very profitable line of goods. The Comyn-Macall Company, 310 California street, San Francisco, are distributors of Plastergon for the Pacific Coast.

Test of Three Sweeper Tuec Cleaner

The Engineering Department of Brown University, Providence, R. I., recently conducted an exhaustive test of a Tuec Air Cleaner, results of which are given below.

It is interesting to note the large volume of air given at the end of the hose. This volume would be amply sufficient to pick up any material able to enter the large tool openings or the large hose openings.

A Tuec Vacuum Cleaner (No. 600) was installed in the basement of a building in Providence and connected to suitable openings on the various floors by 3-inch risers to the fourth floor and by 2½-inch risers from there to the eighth. This machine was driven by a 5 h.p. d.c. motor designed to run at 3500 r.p.m. All tools were attached to the wall openings by 25 feet of 1¾-inch hose.

With all openings closed and a voltage of 498, the motor ran at a speed of 3416 r.p.m. and used 2.64 kw. Under this condition a vacuum of 2.7-in. was obtained at the machine.

With one floor tool open on the end of a 25-ft. length of hose, the motor used 3.28 kw.

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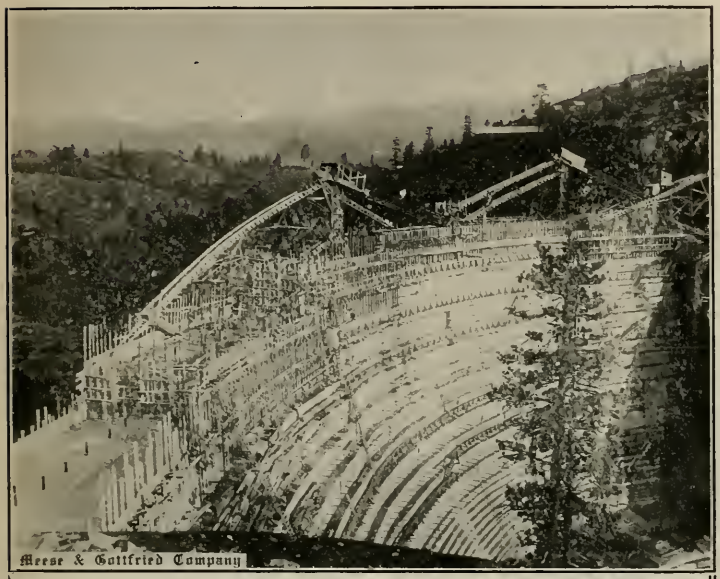
Bet. Mission and Howard Sts. Telephones: Market 2251 Home M2251

Building the Big Concrete Dam at Lake Spaulding



The Conveying and Transmission Machinery used in the construction of this dam was built by us.

The Wet Concrete used is being carried on M & G Belt Conveyors—**two thousand cubic yards a day** up an incline of eighteen degrees!

Do you think the engineers in charge would use M & G machinery on a two-million-dollar job if it was not **the best?**

Meese & Gottfried Company

ENGINEERS AND MANUFACTURERS

Transmission, Elevating, Conveying and Screening Machinery

San Francisco 658-664 Mission St. Seattle 558 First Ave. S. Portland 67-69 Front St. Vancouver, B. C. Pacific Building Los Angeles 130-132 N. Los Angeles St.

Send for 500-page Catalog

With two-floor tools on 25-ft. lengths of hose and one wall socket open, the motor used 5.02 kw.

The vacuum measured at the eighth floor, when all openings were closed was 2.65 inches.

With one 25-ft. length of hose and unequipped with tools, open, the vacuum was 2.5 inches.

With two 25-ft. lengths of hose, and unequipped with tools, open, the vacuum was 2.05 inches.

With three 25-ft. lengths of hose, unequipped with tools, open, the vacuum was 1.8 inches.

Two hundred and thirty cubic feet of air per minute was drawn through one length of open hose when all other openings were closed; 418 cu. ft. of air per minute was drawn through two lengths of open hose when all other openings were closed, and 567 cu. ft. of air per minute was drawn through three lengths of open hose when all other openings were closed.

Inquiries should be addressed to Mr. Jas. J. Martindale at the Canadian factory, 159-61 Richmond street west, Toronto.

The Thirteen-Story Building

In Graphite, published by the Joseph Dixon Crucible Company, there is the following comment concerning New York buildings:

"The report of the Superintendent of the Bureau of Buildings of New York City, Mr. Rudolph P. Miller, reveals the interesting fact that the average height of New York's 120,000 buildings is thirteen stories; and also that there are more thirteen-story buildings than of any other height, this height being judged to give the best average in meeting taxes, running expenses of elevators, interest on investment, and possible rents.

"In London, England, and on the continent, thirteen stories have also been found to be about the most paying and desirable height; in fact, many European cities legislate against a greater height. There are 389 thirteen-story buildings in New York City; the next most popular heights in their order being twelve, eleven and ten stories.

"New York has one building each of fifty-five, forty-five, forty-one and thirty-eight stories."

The note goes on to say that Dixon silica graphite paint has been largely used on the steel work on New York buildings, and this is undoubtedly true.

Manual Arts Building for Sacramento

Plans drawn by Architect E. C. Hemmings for the proposed manual arts annex to the Sacramento high school building have been approved.

The building is to be erected on the L street side of the high school lot and will be two stories high. It will cost $55,000 to erect and an additional $13,000 to properly equip. All machinery for the education of the young men who desire to learn more in the way of mechanics and technology will be operated by individual motors, eliminating chances of accidents from belting.

THE EXCELSIOR DUMB WAITER

¶Self-Retaining Machine, Hardwood Car, Ropes, Guides, Weight, Lumber and Hardware. No splicing necessary. Explicit working directions sent with every outfit. We sell direct to the consumer, and give an up-to-date Waiter for the price of an inferior one. *Send for Descriptive Pamphlet.*

R. M. RODGERS & CO.
Manufacturers
Brooklyn, N. Y.

M. E. HAMMOND
California Representative
217 Humboldt Bank Bldg., San Francisco, Cal.

Nelson Vitreous China Drinking Fountain

Thoroughly Sanitary. All parts open to facilitate cleaning
Full Stock Carried in San Francisco and Los Angeles
Write for Catalog
N. O. NELSON MFG. CO.
STEAM AND PLUMBING SUPPLIES
S. F. Warehouse & Offices, 978-982 Howard St.
TELEPHONE KEARNY 4970
L. A. Warehouse & Offices, 439 East Third St.

When writing to Advertisers please mention this magazine.

The Best Self-Closing Faucet Made

GUARANTEED for FIVE YEARS at NO EXTRA CHARGE

"GLAUBER F. 803"

No Loose Balls — No Complicated Parts
No Rollers to Crush — No Trouble to Take Apart
No Friction — No Trouble to Reassemble
No Cheap Springs — No Tilting Uplift
No Overriding of Balls — No Leaks or Drips
No Self-Opening under High Pressure

BALL BEARING—SELF CLOSING

Tee, Cross, Lever or No-Ti Handle

These Complete Advantages are not found in any other product

WE ALSO MAKE

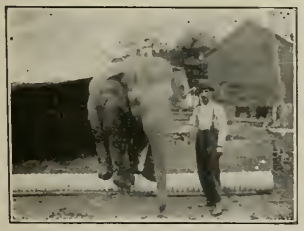
Compression, Fuller and Nu-Rapid Quick Acting Faucets.

GLAUBER BRASS MFG. CO.

CLEVELAND, OHIO

SAN FRANCISCO BRANCH—1107 MISSION STREET

THE ONLY BRASS GOODS GUARANTEED 5 YEARS GLAUBER



Iron Resists Corrosion in Proportion to its Purity.

The advent of **AMERICAN INGOT IRON**, the original pure iron, made of the Corrugated Culvert a practical and reliable installation.

California Corrugated Culvert Co.

American Ingot Iron Culverts, Flumes, Irrigation Gates and Water Troughs.

Los Angeles **West Berkeley**

Permit Issued for California Power Development

A water-power permit has been granted by the Secretary of Agriculture to the Truckee River General Electric Company, a California corporation, under which this company will develop power on the Eldorado national forest, to serve various California towns and cities.

In developing power the company states that it expects to construct seven reservoirs, five for water storage and two for equalizing the flow. Two of the storage reservoirs are on upper Rubicon river. By the use of a tunnel, approximately a mile and a half long, the flow of the upper Rubicon river and the waters stored in these two reservoirs will be brought into the Gerle creek drainage where the waters will be further stored. From this storage the water will be conveyed by ditches and natural streambeds to Pilot creek, upon which the two power plants mentioned in the permit are to be located. The water will finally be discharged into the Rubicon river.

At each of the two plants there will be a head of approximately 1300 feet. The company expects to make an initial installation which will develop about 16,000 horsepower, which will probably be doubled as the market for the product increases.

A Pointer for Advertisers

A statement was made in an address on "Quality Circulation" before the Federation of Trade Press Associations in New York last month to the effect that "more important than the question of how many people a paper reaches is, first, what is the buying power of these people and, second, what is the influence of the paper with them? The impression which an advertisement makes upon a reader is influenced largely by the impression which the publication has made on that same reader. The publication introduces the advertiser and in an introduction much depends upon the intermediary"

"Quality circulation," added the speaker, "cannot be solicited—it must be built. There is no way to send out clever circulation men or devise an attraction for business men who will constitute quality circulation."

1,000,000 General Circulation with 1000 Buyers
1000 Specific Circulation with 1000 Buyers
(The Space between the inner and outer circle is waste)

How this applies to the advertiser is also shown by the statement that "the advertiser who buys circulation alone should employ his workmen by size regardless of skill, should hire his lawyers on price regardless of knowledge and should purchase his medicine by the gallon regardless of ingredients."

Move to Larger Quarters

The Fibrestone & Roofing Company, which firm succeeded Messrs. Ford & Molott over a year ago, and has since done a splendid business in composition flooring, roofing and paving, is now at 971 Howard street, between Fifth and Sixth streets, San Francisco, where the factory will also be located. By having the office and factory together the business of the company will be better facilitated and orders will be promptly attended to.

Imperial Waterproofing

Attention is called to the advertisement of the Imperial Company, waterproofing specialists, which appears on page 153 of this issue. The company's products were used on the El Dorado county courthouse, Placerville, Cal., C. C. Cuff, architect, and which building is illustrated in this number. Imperial Waterproofing is specified extensively by San Francisco architects and the product is giving splendid satisfaction.

Established 1886 Phones, Market 2848 J-2848

T. H. MEEK COMPANY

Show Cases, Hardwood Interiors
General Cabinet Making

Manufacturers of BANK, OFFICE, STORE, CAFE, SALOON **FIXTURES**

Factory,
1159-65 Mission St. and 660-70 Minna St.

Salesrooms,
1157 Mission St. San Francisco

The Man Who Makes the Goal

IS the Star upon whose skill the team relies at the crucial moment. In the Architectural world, the Star who makes the goal is the man of experience who knows just the right varnish to use at the proper time. At the crucial moment, when only one result will answer, such Architects prove their training and knowledge by specifying

Glidden's Green Label Varnishes

Endurance Wood Stains **White Enamels**

JAP-A-LAC

Flat Wall Finishes **Cement Coatings**

And the results of such expert judgment are not only spectacular but lasting — adding to the reputation of the Architect who knows the best varnishes for each desired effect.

If you are planning special work requiring a high lustre, enduring finish let us tell you just which Glidden Specialty will best serve your purpose.

FACTORIES
CLEVELAND, OHIO
TORONTO,
CANADA

THE Glidden VARNISH CO.
CLEVELAND, OHIO.

BRANCHES
NEW YORK
CHICAGO
LONDON

THE WHITTIER-COBURN CO., Distributors - SAN FRANCISCO, CAL.

PHONE SUTTER 98

McLERAN & PETERSON

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SHARON BUILDING — SAN FRANCISCO, CAL.

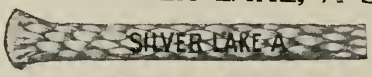
O. BAMANN, President — ERNEST HELD, Vice-President

HOME MANUFACTURING CO.

BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION

543 and 545 BRANNAN ST. Phone Kearny 1514 — San Francisco, Cal.

SILVER LAKE, A SASH CORD



Avoid Sash Cord Troubles among your clients by specifying SILVER LAKE A. Write for Samples and our Guarantee Certificate. It protects you.

Our name is stamped on every foot of our cord

Pacific Coast Agent, SANFORD PLUMMER, 149 New Montgomery St., San Francisco, Cal. — SILVER LAKE COMPANY, BOSTON, MASS.

TAYLOR & CO.

ESTABLISHED IN 1860

Lumber, Millwork, Sash and Doors

2001 Grand Street, Alameda, Cal.

Telephone Alameda 3100

SAN FRANCISCO OFFICE,
316-317 Sharon Building
Telephone Sutter 1170

OAKLAND OFFICE
480 Tenth Street
Telephone Oakland 2991

PHONE SUTTER 1533

FOSTER VOGT CO.

Contractors

CONCRETE FIRE PROOFINC AND GENERAL BUILDING CONSTRUCTION

Sharon Building — San Francisco, Cal.

JOHN PETROVFFSKY

Manufacturer

TILES AND GRATES

Show and Warerooms
523 VALENCIA ST., near 16th

Telephone Market 4689
SAN FRANCISCO, CAL.

Dealer in

TILES

FOR SINKS, MANTELS
WAINSCOTING, FLOORS
AND VESTIBULES

Niels M. Alling — Phone Park 5054 — H. Hallensleben

MONARCH IRON WORKS

ORNAMENTAL IRON AND BRONZE

Member of Builders Exchange and General Contractors Association

Office and Works: 1159 to 1165 Howard St. — San Francisco, Cal.

Phones: Berkeley 3299; Home F 1821 — Estimates Given

HUGHSON & DONNOLLY

CONTRACTORS AND BUILDERS

Office and Shop
1608 STUART STREET — BERKELEY, CAL.

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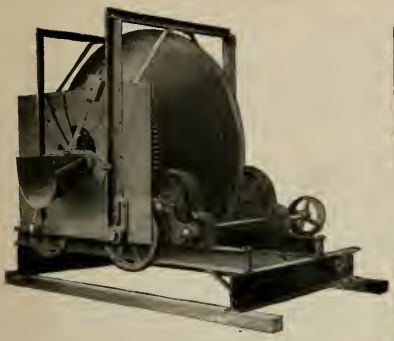


Concreting Stockton Street Tunnel

The tunnel now under construction, running in Stockton street from Sutter to Sacramento streets in San Francisco, is to be lined with concrete by a process which is a new one on the Pacific Coast.

A large stationary concrete mixing plant has been installed by the contractors, The Jacobson-Bade Company and K. C. Lundstrom, an overhead bin being provided for the concrete aggregates so arranged that two men can attend to the feeding of the concrete mixer, which is a No. 7 Foote batch mixer, electrically driven, having a capacity of 40 cubic feet per batch. It is the largest concrete mixer ever used in San Francisco.

After the concrete is mixed it is discharged into a concrete blower, and the concrete is conveyed under pressure by compressed air through the pipes to the point where it is to be used.

The Foote concrete mixer was sold by the Edward R. Bacon Company, which concern now maintains sales offices in both San Francisco and Los Angeles, and is in position to give complete information with reference to this new method of mixing and placing concrete.

Big Cargo of Oak Logs

The last cargo of oak logs of the season is on the way from Japan to San Francisco, consigned to Dieckmann Hardwood Co., and is expected about the 25th of November. This shipment, although small, will contain a large assortment of lumber as well as logs and is made up of the picked pieces from the season's cuttings. The above-mentioned firm is the only concern hereabouts having its own saw mills, including veneer saws and dry kilns, on its premises, and consequently is most favorably situated for converting with advantage all its log importations into lumber or veneers.

Beauty and Durability

are blended together in

Satinette

The Perfect White Enamel.

We beg to call to your attention just a few good reasons why SATINETTE is becoming more popular every day.

First: It is as white as snow yet as durable as granite.

Second: It is absolutely sanitary.

Third: Dirt cannot collect on it unobserved, as its whiteness shows every speck which cannot be removed, thereby protecting the health.

Fourth: It has withstood the most severe tests and we can state without fear of contradiction that it will not chip or peel.

Manufactured and backed by the

STANDARD VARNISH WORKS

113 Front Street, San Francisco

New York Chicago

When writing to Advertisers please mention this magazine.

A Noteworthy Extension

Sherman Kimball & Company, manufacturers agents, have removed to the northeast corner of First and Howard streets, where they will occupy the substantial brick building formerly occupied by the Geo. E. Dow Pumping Engine Company.

In their new quarters Messrs. Kimball & Company will have facilities for handling their rapidly increasing business. They now represent a number of Eastern manufacturers, including Blaisdell Machinery Company, Kauffman Heating & Engineering Company, Majestic Furnace Company, Canton Mfg. Company, Hill-Canton Dryer Company, Keyless Lock Company, Thomas & Smith, Loomis-Manning Filter Company, Goheen Manufacturing Company, Stahl Clock Company and several others of equal prominence.

It is easy to get stung,

But it is just as easy to get the Best Elevator

Door Hangers

by always specifying

"RELIANCE"

The magic Hanger for Speed, Silence and Ease of action.

Reliance Ball Bearing Door Hanger Co.

1 Madison Avenue, New York

PACIFIC COAST AGENTS:

Sartorius Company.....San Francisco, Cal.
Louis R. Bedell. ....Los Angeles, Cal.
Portland Wire & Iron Works..Portland, Ore.
D. E. Fryer & Co..... Seattle, Wash.

The Dahlstrom Architectural Portfolio

Just issued by the Dahlstrom Metallic Door Company primarily for the purpose of furnishing Architects and Builders specific information for the use of hollow metal doors, interior trim and other work in modern fireproof buildings, is now ready for distribution.

The Portfolio contains twenty full page plates 13 inches by 17 inches, showing designs and detailed construction together with photographic illustrations of some of the most notable installations of the Dahlstrom Products in a number of prominent buildings, and shows the manner in which many of the leading architects design this class of work.

The Architectural Portfolio will prove useful to Architects, Architectural Draftsmen, Students and others, as it contains the necessary information regarding the most practical methods of construction, preparation for and installation in buildings of hollow metal doors and trim.

The Portfolio may be termed a perpetual one, as provisions have been made for the insertion of additional plates which will be issued from time to time to show new or novel features as they may develop.

To make this Portfolio available to everyone in any way interested in the subject it is placed on the market at a price of Five Dollars ($5.00) per copy.

DAHLSTROM METALLIC DOOR COMPANY

Executive Offices and Factory

34 Blackstone Av., Jamestown, N. Y.

Branches in all Principal Cities.

San Francisco Representative:

M. G. WEST CO., 353 Market Street

PACIFIC FIRE EXTINGUISHER CO.

ENGINEERS AND CONTRACTORS

Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER

Main Office. 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

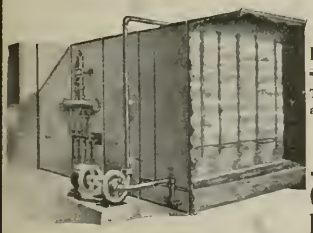
Branch Offices: 217-218 Colman Building - - - - - - - - - Seattle Wash.
504-505 McKay Building - - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - - Spokane, Wash.
503 I. W. Hellman Building - - - - - - - - Los Angeles, Cal.

LITHOID FLOORING and LITHOID DAMPPROOFING

This composition mixed and tested upon strict Chemical Analysis.
FLOORS made of this material POSITIVELY GUARANTEED.

LITHOID PRODUCTS CO.

General Offices: 1034 MERCHANTS EXCHANGE BLDG.
Telephone Sutter 1475 **SAN FRANCISCO**



AIR WASHERS

HUMIDIFYING AND AIR COOLING APPARATUS

The Best on the Market, and made in San Francisco

98½% Efficient

Let us Figure With You Plans and Estimates Free

Results Guaranteed

CALIFORNIA AIR PURIFYING CO.

OFFICE,
3261 17TH STREET
Phone Market 8569

STEEL FURNITURE and FIXTURES

FILING CASES, STORAGE CABINETS, ROLLER AND PLAIN SHELVING, ETC.

A complete line of Steel Furniture for Court Houses, Banks, Office Buildings and general usage.

Requirements figured and preliminary drawings and estimates furnished free of cost to Architects and Buyers. Send us your specifications.

Metal Furniture Department **THE KEYLESS LOCK COMPANY** INDIANAPOLIS, INDIANA

MASONIC HOSPITAL, SAN FRANCISCO
O'Brien & Werner, Architects

Exterior Faced with

RED PRESSED

BRICK

Manufactured by

LOS ANGELES PRESSED BRICK CO.

LOS ANGELES, CAL.

UNITED MATERIALS COMPANY

Distributors for Northern California

604 BALBOA BUILDING SAN FRANCISCO, CAL.

When writing to Advertisers please mention this magazine.

Pittsburg Company Expands

The Pittsburg Water Heater Company announces the removal and the opening of their new sales office and display room, 237 Powell street, ground floor, between Geary and O'Farrell, San Francisco.

In their new show room they have in actual operation all the various sizes of "Bungalow" Automatic Gas Water Heaters as well as several of the large "Pittsburg" Automatic Gas Water Heaters, and extend a cordial invitation to architects and their clients to call and witness demonstrations.

For the past few years the local agency has been handled by Mr. Joseph Thieben, who sold out his interest on October 1st in order to devote his time and attention to his other agencies which require closer supervision, and finding that he could not take care of all the agencies, the change was made, and the entire state business is now handled by one agency—a direct factory representative.

In this connection announcement is made of the appointment of Mr. George H. Farrell, for the past few years connected with the Gas & Electric Appliance Company of San Francisco, as sales manager, with headquarters at 237 Powell street.

Sixty Years of Business

The paint house of C. H. Krebs & Co., Inc. of 626 J Street, Sacramento, was established in business in 1854. They are the oldest paint house doing business in California today in the same location as 60 years ago. This is certainly an enviable asset, and one the firm points to with pride. Mr. Harry G. Krebs, the present president of the concern, was born on the very premises where the large and growing business has been conducted for so many years. Mr. George P. Moore is Vice-President and General Manager. They are importers and jobbers of a large number of standard lines of painting and decorating materials. A considerable measure of their success can be attributed to their well known policy of "quality and high-class, prompt service."

Good Contract for Berkeley Man

W. J. McGraw of Berkeley, Cal., has secured a fine contract for all the concrete and plastering of the large precooling plant of the Pacific Fruit Express at Roseville, Cal. The building is about 128x287 feet in dimensions and 50 feet high. There will be over 4,000 cubic yards of concrete, 8,000 yards of cement pebble-dash plastering, 10,000 yards of cement interior wash and some 50,000 square feet of cement floors. The plans and supervision of the work are by the engineering department of the Southern Pacific Company.

When you roof your buildings who is responsible for it?

Our contract department will lay and guarantee the roofing our factory makes. When you deal with us we are wholly responsible for the job.

Deal with the makers

THE PARAFFINE PAINT CO.

34 First St., San Francisco

Competition to Be Held

It is stated in Boston daily papers that the architect for the Massachusetts State Building at the Panama-Pacific Exposition will be selected by a state-wide competition. It is further stated that Professor James Knox Taylor, of the department of architecture of the Massachusetts Institute of Technology, has been selected by the State Board of Managers as advisory architect.

Union and Contractors Conflict

Differences have arisen between the Bricklayers' Union and the General Contractors' Association because of a demand of the union that the association sign a new wage agreement, several of the features of which are said to be objectionable to the contractors. One clause is a demand that the contractors contribute to a fund to promote brick construction.

New Architects

The State Board of Architecture has granted certificates to practice architecture to James Peddle, St. Louis Building, Pasadena; Chas. Gordon, 840 South Hope street, Los Angeles; I. J. Knapp, 2122 Hilldale avenue, Los Angeles.

C. F. WEBER & CO.

Manufacturers of

SEATING FOR ALL PUBLIC BUILDINGS

The New "Sanitary Steel" Automatic Desk.

School Desks, Church Pews, Opera Chairs, Hall Seating, Bank Furniture, Lodge Furniture and Equipment, P. O. Cabinets. Also Venetian Blinds, Rolling Wood Partitions, School and Church Bells, Maps, Map Cases, Globes. Manufacturers of the Celebrated Hyloplate Blackboards, in use in nearly all school buildings

Ask for booklet **"Good Blackboards"**; also "Handbook of Seating." They are FREE to Architects.

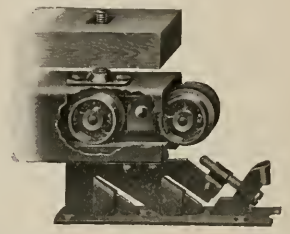
OFFICES:

365-367 MARKET ST., SAN FRANCISCO

512 S. BROADWAY, - LOS ANGELES

OPEN AND SHUT

They slide so still you never know
Unless you see them shut,
They occupy no needed space
Nor bang, nor slam, nor butt.



LARGE doorways increase the effect of space in small houses or apartments, and permit of more beautiful decorative treatment in larger homes.

Install sliding doors in these openings, and you have conveniences for all occasions.

Privacy of separate rooms.

Use of all rooms if desired.

Comfortable ventilation.

No wasted wall or floor space "behind the door" or when it is opened and closed.

Fuel economy. No need to heat the whole house in cold wintry weather.

Our No. 10 Catalog (Special Architect's edition) is sent on request.

Richards-Wilcox

Manufacturing Co.

Aurora, Ill. U.S.A.

Why Gasolene is Dangerous Around Home

A DANGEROUS PLAYTHING FOR YOUR CHILDREN

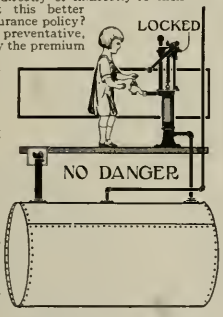
"Gasolene evaporates rapidly, and the gas it makes is seven times more dangerous than gunpowder. A single spark would cause a frightful explosion." (Extract taken from "Individual Fire Fighting," published by the Rochester [N. Y.] Chamber of Commerce.) Is this volatile, elusive liquid a safe plaything for your or your neighbor's child? Then why store it above ground? Why not put it away in a

Bowser Safe Oil Storage System

where it is as safe to handle as water and out of innocent children's curious reach? These outfits are built to conform to that measure of safety prescribed by the National Board of Fire Underwriters, and their Laboratory is so labeling them. Is it any wonder that out of the

Million Satisfied Users

all over the world there has never been a fire traced directly or indirectly to their use? Isn't this better than an insurance policy? It is a fire preventative, and you pay the premium but once.



Write for our handsomely illustrated booklet, "At the Sign of the Red Sentry." Mailed free upon request. It will give you details on oil storage that are well worth your reading.

S. F. BOWSER & CO., Inc.
612 Howard St., SAN FRANCISCO
Telephone, Douglas 4323.

Home Plant and General Offices
Fort Wayne, Ind., U. S. A.
Box 2115
Sales offices in all Centers and Representatives Everywhere.

Original patentees and manufacturers of standard, self-measuring, hand and power driven pumps, large and small tanks gasolene, and oil storage and distributing systems, self-registering pipe line measures, oil filtering and circulating systems, dry cleaner systems, etc.

Established 1885.

THE E. HOWARD CLOCK COMPANY of Boston, New York and Chicago, desires to increase its Pacific Coast business through its representatives in Seattle, Wash., Portland, Ore. and San Francisco, Cal.

In the past seventy years many representative clocks of Howard manufacture have been installed all over the country West of the Mississippi. We refer to just a few of the more recent ones:

Arthur Letts Garage.....Los Angeles
Baker County Court House.....
.....Baker City, Ore.
Bank of San Jose.....San Jose, Cal.
Boulder County Court House.....
.....Boulder, Colo.
Fergus County Court House.....
.....Lewiston, Mont.
Library.....Berkeley, Cal.
Missoula County Court House.....
.....Missoula, Mont.
Multnomah County Court House..
.....Portland, Ore.
Northern Pacific Depot.....
.....Tacoma, Wash.
Pierce County Court House.....
.....Tacoma, Wash.
Providence Hospital....Seattle, Wash.
Queen Anne High School.....
.....Seattle, Wash.
San Juan County Court House.....
.....Silverton, Colo.
Seattle Union Depot...Seattle, Wash.
Snohomish County Court House....
.....Everett, Wash.
St. Mary's Paulist Church.....
.....San Francisco, Cal.
Tacoma City Hall....Tacoma, Wash.
Union Depot and Ferry House.....
.....San Francisco, Cal.
University of California.....
.....Berkeley, Cal.
Washington Hotel.....Seattle, Wash.
Etc. Etc.

Please correspond with any of the Pacific Coast representatives:

Jos. Mayer & Bros., Seattle, Wash.
Butterfield Bros., Portland, Ore.
Morgan & Allen Co., San Francisco

or with the

E. HOWARD CLOCK CO.
BOSTON NEW YORK CHICAGO

FULLER VARNISHES

The New Product

in the same class
with

PIONEER LEAD

AND

PURE Prepared PAINT

Specify...

40 — Forty For Finishing — 40
50 — Fifty For Flatting — 50
15 — Fifteen For Floors — 15

W. P. FULLER & CO.

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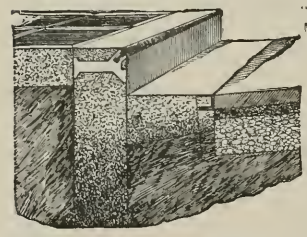

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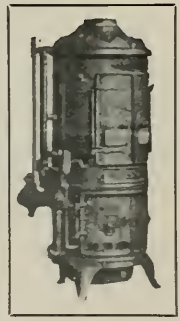

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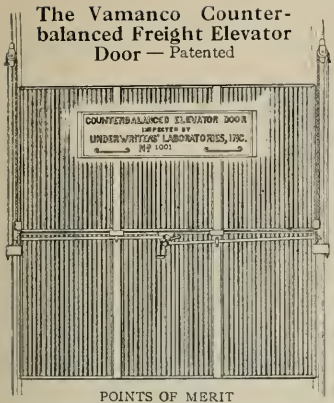

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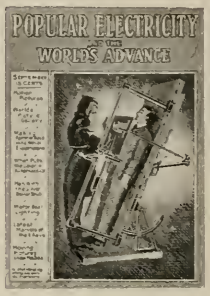

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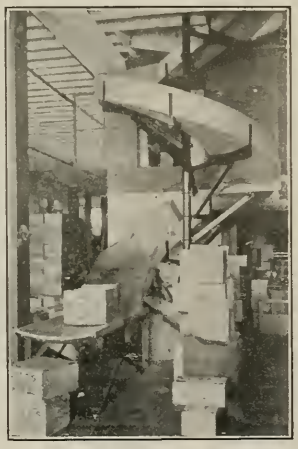

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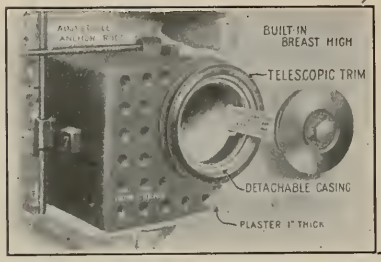

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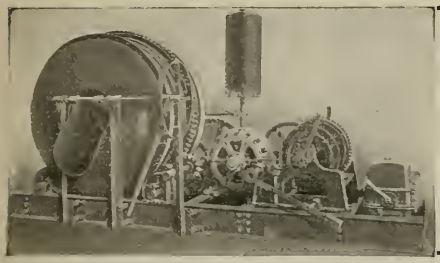

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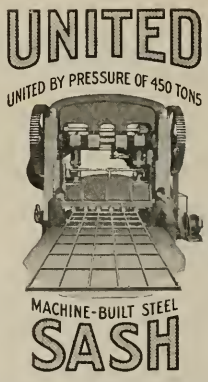

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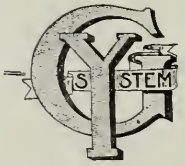

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(For Index to Advertisements, see next page)

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An Index to the Advertisements

American Mason Safety Tread 153
American Paint Co. 26
American Revolving Door 129
American Rolling Mill Co. 32
American Sheet & Tin Plate Co. 21
Ames-Irwin Co. 169
Amweg, Frederick J. 127
Angelus Hotel 164
Armstrong Cork Co. 156
Ashlock Door Guard 160
Atlantic Fireproofing Co. 130
Atlas Heating and Ventilating Co., Inc. 125
Atlas Portland Cement Co 34
Bacon, Ed. R. 44
Barrett & Hilp 162
Bay Development Co. 166
Beaudet, Geo. E. 149
Beler Heater Co. 122
Berger Mfg. Co., The 151
Berry Bros. 4
Bill & Jacobsen 162
Bird, F. W. & Son 4
Biturine Co. 44
Blaisdell Machinery Co. 35
Bluxome & Co. 149
Bosch, Hermann 122
Bowser & Co., S. F. 145
Boxton, Geo. W. 171
Braun, J. G. 40
Breite, W. W 122
Brick Builders' Bureau. Insert D
Briggs Bituminous Paint Co. 30
Brode Iron Works 11
Brown Hoisting Machinery Co. 18
Building Material Co., The, Inc. 6
Butte Engineering Co. 122
Burlington Venetian Blind Co. 153
C. Jorgenson & Co 160
Cabot, Samuel (Inc.) 18
California Air Purifying Co. 141
Calif. Artistic Metal & Wire Co. 14
California Bldg. Material Co. Second Cover
Calif. Corrugated Culvert Co. 135
California Granite Co. 163
California Photo Engraving Co. 170
California Plumbing Supply Co. 43
California Sales & Supply Co. 154
Calif. Safety Fireproof Co. 22
Canton Manufacturing Co. 158
Central Electric Co. 125
Central Iron Works 41
Ceresit Waterproofing Co. 3
Chowen, W. A. 170
City Supply Co., Inc. 149
Clark-Ludwig 159
Clark, N., & Sons 29
Clinton Fireproofing Co. 150
Coleman, Alex 127
Colonial Fireplace Co. 43
Columbia Marble Co. 10
Comyn, Mackall & Co. 28
Concrete Appliances Co. 2
Cook, H. N., Belting Co. 35
Cowell Lime & Cement Co. 154
Crane Co. 43
Crosett & Eastman 162
Cutler Mail Chute Co. 38
Dahlstrom Metallic Door Co. 140
Davis-Rogers Co. 168
Delta Construction Co. 130
De Rome, Louis 122
Diamond Brick Co. 28
Dieckmann Hardwood Co. 123
Dixon, Joseph Co. 9
Douglas, John Co. 43
Dunham Co., C. A 12
Dyer Bros. 39
Edwards, Burt E. 154
Elevator Supply and Repair Co. 136
Electric Agencies Co. 125
Engstrum, F. O 169
Fess System 170
Fibrestone and Roofing Co. 11
Fidelity and Deposit Company of Maryland 125
Finch, Chas. M. 154
Fink & Schindler Co., The 132
Fisher Tile Co. 170
Flagg, Edwin H., Scenic Co. 7
Florentine Art Studio 166
Forbes, A. J. & Son 157
Foster, Vogt Co. 138
Fuller, W. P., Co., Color Insert B
Giant Suction Cleaner Co. 161
Gladding, McBean & Co. 30
Glauber Brass Mfg. Co. 146
Glidden Varnish Co. 137
Globe Indemnity Co. 166
Goheen Mfg. Co 17
Golden Gate Brick Co. 14
Golden Gate Structural and Ornamental Iron Works 16
Gordon Construction Co. 166
Graham & Jensen 171
Grant Gravel Co. 7
Harron, Rickard & McCone 10
Haslett Co., The 156
Hausmann, L. H. 162
Heath & Milligan Color Insert C
Hercules Waterproofing Cem. Co. 135
Higginson Co., Inc 140
Hill-Canton Dryer Co. 165
Hillard, C. J., Co. 42
Holmes Lime Co. 9
Home Heating Co 122
Home Mfg. Co. 138
Howard, P. F. 162
Howard Clock Co. 145
Hughson & Donnolly 138
Hunt, Robt. W. & Co. 129
Hunter & Hudson 130
Ils, John G. 162
Independent Sewer Pipe & Terra Cotta Co. 159
Industrial Engineering Co. 15
Insley Co. 25
Iroquois Iron Works 42
Jarvis, J. P 159
Jenkins Bros. 153
Judson Mfg. Co. 42
Kauffman Heating Co. 17
Kawneer Mfg. Co 160
Kennedy, David 133
Keyless Lock Co. 141
Kieffel & Esser 2d Cover
Kimball, Sherman & Co., 162 and 17
Klenck, F. J. 171
Knowles, A. 160
Koehring Mixer 37
Kohler, Company 19
Krebs & Co. 157
Langford, Felts & Meyers, 44, 162
Lettich, A 125
Lettich, J. M. 162
Levensaler-Spier Corp'n 29
Lilley & Thurston 3d Cover
Liquid Stone Cement Co 31
Lithoid Products Co. 141
Livermore & Co., Norman B. 169
Livermore Fire Brick Co. 30
Los Angeles Pressed Brick Co. 5
Lowrie Safe Co. 160
Lynch, A. 166
Mackenzie Roof Co. 127
Majestic Furnace Co. 151
Mangrum & Otter 44
Mark-Lally Co. 154
Marsh-Catron Co. 36
Marshall & Stearns Co. 39
Maris Hardwood Co 123
Massachusetts Bonding and Insurance Company 130
McGraw, W. J. 166
McLeran & Peterson 138
Meek, T. H. 136
Meese & Gottfried Co. 133
Moller & Schumann Co. 20
Monarch Iron Works 138
Monson Bros. 171
Mortenson Construction Co. 132
Mott Iron Works 149
Municipal Engineering Co. 156
Muralo Co. Color Insert A
Musto-Keenan Co. 12
Nason, R. N., & Co. 13
Nathan, Dohrmann Co. 127
National Lumber Co. 158
Nelson, N. O. 134
New York Belting & Packing Co., Ltd. 126
Niles Sand, Gravel & Rock Co. 28
Norris Co., L. A., Inside Front Cover
Olinger, A. M. 13
Olive & Leary 130
Otis Elevator Co. Back Cover
Pacific Coast Casualty Co. 168
Pacific Fire Extinguisher Co. 141
Pacific Gas & Electric Co. 156
Pacific Hardware and Steel Co. 149
Pacific Imp. Co., Outside Back Cover
Pacific Rolling Mills 41
Pacific Structural Iron Works. 171
Pacific Sewer Pipe Co. 30
Paraffine Paint Co. 143
Parcells & Cook 182
Parrott & Co. 2-3-33
Parry Stone Co. 157
Patrick-Nelson Co. 159
Petersen, H. L. 171
Petersen-James Co. 122
Petrovffsky, John 138
Pitcher Door Hanger 158
Pittsburg Heater Co. 148
Pneulectric Co. 149
Portland Pile Co. 168
Pratt Building Material Co. 121
Prometheus Electric Co. 35
Ralston Iron Works 41
Ransome Concrete Co. 130
Reliance Ball-Bearing Door Hanger 144
Richards-Wilcox Mfg. Co. 144
Rickon, F. J. 159
Rodriguez Y Villa Co., A. 158
Roebling, Jno. A 40
Rolandi, F. 149
Roman, C 160
Rudgear-Merle Co. 147
Russell & Erwin Mfg. Co. 33
Sac'mento Sandstone Brick Co. 40
Samson Cordage Works 130
S. F. Metal Stamping and Corrugating Co. 151
S. F. Elevator Co 162
S. F. Pioneer Varnish Works. 23
Santa Fe Lumber Co. 165
Sarsi, O. S. 127
Sartorious & Co. 38
Scarrett, H. M. 159
Schoenfeld Marble Co. 154
Schrader Iron Works. 170
Scott, Walter. 157
Shreiber & Sons Co. 38
Silver Lake Sash Cord Co. 138
Spencer Elevator Co. 13
Standard Co. 28
Standard Elec. Time Co., Insert A
Standard Oil Co. 24
Standard Port. Cement Corp. 26
Standard Varnish Works 22
Steel Protected Concrete Co. 146
Steiger Terra Cotta & Pottery Works 29 and 152
Stephenson, Edward 154
Strable Manufacturing Co. 165
Sunset Lumber Company. 165
Sutton, John G., Co. 125
Taylor & Co. 138
Trost, Robert 168
Totten & Brandt 168
Tozer Company 161
Trussed Concrete Steel Co. 172
Tucc Co. 27
Turner, C. A. P 15
Tyrrel, Horace W. 162
Union Hardware and Metal Co. 166
Union Metal Corner Co. 20
United Materials Co. 5
U. S. Metal Products Co. 45
U. S. Steel Product Co. 155
Universal Safety Tread Co. 42
Van Dorn Iron Co. 21
Van Emon Elevator Co. 4
A. R. Y. Villar Co. 168
Variety Mfg. Co. 151
Vonnegut Hardware Co. 23
Vulcan Iron Works 38
Wadsworth, Howland & Co. 31
Wallace Machy. Co. 26
Ward & Goodwin. 159
Watson Mantel & Tile Co. 166
Weary & Alford Co. 149
Weber, C. F. & Co. 156
West Coast Wire & Iron Works 168
Western Builders' Supply Co. 37
Western Furnace Co. 125
Western Iron Works. 41
West, M. G. 130
White Bros. 121
Williams Bros. & Henderson. 169
Williams, H. S. 142
Wittman, Lyman & Co. 125
Woods & Huddart 147
Yager Metal Works. 157
Zelinsky, D 157

DIXON'S SILICA GRAPHITE PAINT
BEST FOR STEEL SURFACE PROTECTION
JOSEPH DIXON CRUCIBLE CO., Pac. Coast Branch 155 Second Street SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR WATERPROOF COATING
- American Paint & Dry Color Co., 414 Ninth St., S. F.
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See distributing Agents on page 32.]
- Biturine Co. of America, 24 California St., S. F.
- Hercules Waterproofing, manufactured by Hercules Waterproofing Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
- Liquid Stone Paint Co., Hearst Bldg., S. F. Concrete Cement Coating, manufactured by the Muralo Company. (See full-page advertisement, color insert.)
- Trus-Con Par-Seal, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
- Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT EXTERIOR FINISH
- American Paint & Dry Color Co., 414 Ninth St., S. F.
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of Distributing Agents on page 31.]
- Concrewaltum Paint, manufactured by Goheen Company, Canton, O. Coast branches, San Francisco, Portland and Seattle.
- Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
- Liquid Stone Paint Co., Hearst Bldg., S. F.
- Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., S. F. Concrete Cement Coating, manufactured by the Muralo Company. (See full-page advertisement, color insert.)
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of Distributing Agents on page 31.]
- Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.

CEMENT TESTS AND CHEMICAL ENGINEERS
- Robert W. Hunt & Co., 418 Montgomery St., S. F.

CHURCH INTERIORS
- Fink & Schindler.....218 13th St., S. F.

COAL CHUTES
- Majestic Furnace Company, Sherman Kimball & Co., Inc., 1st and Howard Sts., S. F.

COLD STORAGE PLANTS
- Vulcan Iron Works.....S. F.

CLOCKS—TOWER AND STREET
- E. Howard Clock Company.....New York For Pacific Coast agents see advertisement.

CLOTHES DRYERS
- The Hill-Canton Dryer Company, Canton, O., represented by Sherman-Kimball & Co., Inc. .....S. F.

COMPOSITION FLOORING
- Fibrestone & Roofing Co., 971 Howard St., S. F.
- Lithoid Products Co., Merchants Exchange Bldg., S. F.

CONCRETE CONSTRUCTION
- Bluxome & Co., Monadnock Bldg., S. F.
- Clinton Fireproofing Company, Mutual Bank Bldg., S. F.
- "Mushroom" System of Concrete Flat Slab Construction, Industrial Engineering Co., Clunie Bldg., S. F.
- Barrett & Hilt .....Sharon Bldg., S. F.
- Foster, Vogt Co.....Sharon Bldg., S. F.
- Petersen, H. L. .....62 Post St., S. F.
- A. Lynch.....185 Stevenson St., S. F.
- Ransome Concrete Co., Oakland & Sacramento
- W. J. McGraw, 1636 Felton St., S. Berkeley, Cal.
- F. J. R. Rickon.....1859 Geary St., S. F.
- F. J. Klenck.....Sharon Bldg., S. F.

CONCRETE MIXERS
- Austin Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., the Beebe Company, Portland and Seattle, and P. B. Engh, Los Angeles.
- Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., S. F.
- Ransome Mixers, sold by Norman B. Livermore & Co....Metropolis Bank Bldg., S. F.
- Smith Mixers sold by Parrott & Co., San Francisco, Los Angeles and Portland.
- Marsh-Capron Mixers, sold by Langford, Bacon & Myers, Rialto Bldg., S. F.
- Koehring Mixer, sold by Harron, Rickard & McCone, San Francisco.
- Municipal Engineering Co., 338 Brannan St., S. F.

CONCRETE PILES
- Harron, Rickard & McCone, Townsend Street, San Francisco.
- Portland Concrete Pile Co., Underwood Bldg., S. F.

CONCRETE POURING APPARATUS
- Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

CONCRETE REINFORCEMENT
- United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle

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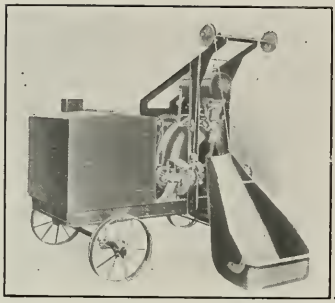

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SAN FRANCISCO — LOS ANGELES

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE REINFORCEMENT—Cont'd.
Clinton Welded Reinforcing System, L. A. Norris, Monadnock Bldg., S. F.
"Kahn System," see advertisement on page 172 this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., S. F.
Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Liquid Stone Paint Co., Hearst Bldg., S. F.
"Concreta," sold by W. P. Fuller & Co., S. F.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
Moller & Schumann...1023 Mission St., S. F.

CONTRACTORS, GENERAL
F. J. Klenck.....Sharon Bldg., S. F.
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Foster, Vogt Co.....Sharon Bldg., S. F.
F. Rolandi.....Bank of Italy Bldg., S. F.
Geo. W. Boxton.. .....Hearst Bldg., S. F.
McLaren & Peterson.....Sharon Bldg., S. F.
Higginson Co., Inc., 804 Humboldt Bank Bldg., S. F
Howard S. Williams.....Hearst Bldg., S. F.
Graham & Jensen....185 Stevenson St., S. F.
Ransome Concrete Co., 1218 Broad'y, Oakland
F. J. Rickon, C. E., 1859 Geary St., S. F.
Robert Trost....26th and Howard Sts., S. F.
Williams Bros. & Henderson, Holbrook Bldg., S. F.
Burt T. Owsley....311 Sharon Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal
Ward & Goodwin.....Sharon Bldg., S. F.

CORK TILING
David J. E. Kennedy, Inc.Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., S. F.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Gobeen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing, manufactured by Hercules Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Lithoid Product Company, Merchants Exchange Bldg., S. F.
Trus-Con Damp proofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F.
Liquid Stone Paint Co....Hearst Bldg., S. F.
Standard Co.....268 Market St., S. F.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works
Richards-Wilcox Mfg. Co.,.....Aurora, Ill.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

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SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., S. F.
Excelsior Dumb Waiters, manufactured by R. M. Rodgers Co., Brooklyn; M. E. Hammond, 217 Humboldt Bank Bldg., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. F. Hammond, Humboldt Bank Bldg., S. F.

ELEVATORS
Otis Elevator Company, Stockton and North Point, S. F.
Spencer Elevator Company, 126 Beale St., S. F.
S. F. Elevator Co.....860 Folsom St., S. F.
Van Emon Elevator Company, Natoma St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., Underwood Bldg., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
Crosett & Eastman.....Hearst Bldg., S. F.
L. M. Hansmann.....Sharon Bldg., S. F.
Hunter & Hudson.....Rialto Bldg., S. F.

EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices mfrd. by Vonnegut Hardware Co. (See adv. for Coast Distributors).

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., Underwood Bldg., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vonnegut Hardware Co. (See adv. for Coast Agencies).

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, T 3435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., 531 Howard St., S. F.
Gladding, McBean & Co., Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., L. A.
The Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors, Monadnock Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Company, 1157 Mission St., S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Moller & Schumann Co., 1022 Mission St., S. F.

FLOORS—CORK
Nonpareil Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., S. F.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co. .....612 Howard St., S. F.

GARBAGE CHUTES
Bill & Jacobsen.....Rialto Bldg., S. F.

GRANITE
California Granite Co., 776 Monadnock Bldg., S. F.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co....153 Berry St., S. F.
California Building Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
Niles Sand, Rock & Gravel Co., 971 Howard St., S. F.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co.....S. F.
American Keen Cement Co, Levensaler-Spier Corporation, Representatives, Monadnock Bldg., S. F.

HARDWARE
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.

HARDWOOD FLOORING
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

W. R. BRODE, Pres. R. J. BRODE, Secretary Telephone Kearny 2464

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JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin 6365 — **MARBLE** — OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD LUMBER
Dieckmann Hardwood Co., Beach and Taylor Sts., S. F.
Parrott & Co.....320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co., First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 237 Powell St., S. F.

LOCKERS
Keyless Lock Co.....Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
Edward Stephenson..155 Fremont St., S. F.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office, Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co., Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F.
A. Lettich.....365 Fell St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co., 17th St., bet. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOSE RACKS AND REELS
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

HOTELS
The Angelus, Loomis Bros.....Los Angeles

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co., 5th and Parker Sts., West Berkeley.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 418 Montgomery St., S. F.

INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.

INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co., 155 New Montgomery St., S. F.

LIME
Holmes Lime Company, Monadnock Bldg., S. F.
Henry Cowell Lime & Cement Co., 9 Main St., S. F.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So.....Oakland, Cal.
Santa Fe Lumber Co., Seventeenth and De Haro Sts., S. F.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (see adv. on page 38 for Coast representatives).

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co., Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.
Joseph Musto Sons-Keenan Co., 535 North Point St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co., Pacific Bldg., S. F.
Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors, Monadnock Bldg., S. F.
John Roebling Sons Co., Folsom St., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
Pratt Building Material Co., Hearst Bldg., S. F.

METAL CEILINGS
Berger Mfg. Co.....1120 Mission St., S. F.
Ames-Irwin Co., Inc., Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metallic Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.
Canton Mfg. Co., Sherman Kimball & Co., First and Howard Sts., S. F.

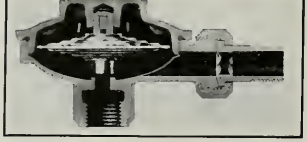
METAL FURNITURE
M. G. West Co..... .353 Market St., S. F.
The Keyless Lock Co.....Indianapolis, Ind.
Van Dorn Iron Works Co.....Cleveland, O.
Chas. M. Finch, 311 Board of Trade Bldg., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

OIL BURNERS
Fess System Co.....220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co., 349 Seventh St., S. F.
J. G. Braun.....Chicago and New York
Ralston Iron Works, 20th and Indiana Sts., S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., S. F.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.
Vulcan Iron Works.....S. F.



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126-128 BEALE STREET
TELEPHONE KEARNY 664 SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

PAINTING AND DECORATING
D. Zelinsky.....564 Eddy St., S. F.
C. H. Krebs & Co.....Sacramento, Cal
Horace W. Tyrrel, 1707 38th ave., Oakland.

PAINT FOR BRIDGES
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Joseph Dixon Crucible Co., Coast branch, 155 Second St., S. F.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company. San Francisco and Los Angeles.

PAINT FOR CEMENT
American Paint & Dry Color Co., 414 Ninth St., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.
Concrete Cement Coating, manufactured by the Muralo company. (See color insert for Coast distributors.)
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors

PAINTS, OILS, ETC.
American Paint & Dry Color Co. 414 Ninth St., S. F.
Concrete Cement Coating, manufactured by the Muralo company. (See color insert for Coast distributors.)
Bass-Hueter Paint Company. Mission, near Fourth St., S. F.
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Standard Co.....268 Market St., S. F.
Moller & Schumann Co., 1022 Mission St., S F.
Berry Bros.....250 First St., S. F.
Paraffine Paint Co....38-40 First St., S. F.
R. N. Nason Company.....San Francisco
Standard Varnish Works.....113 Front St., S. F.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRAPHY
R. J. Waters Co.....717 Market St.,S. F.
Walter Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation.....259 Monadnock Bldg., S. F.
"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.
Herman Bosch.....4420 20th St., S. F.
A. Knowles.....985 Folsom St., S. F.
W. J. McGraw....1636 Felton St., Berkeley

PLUMBING
Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Coleman.....706 Ellis St., S. F.
J. M. Lettich.....Monadnock Bldg., S. F.
Antone Lettich.....365 Fell St., S. F.

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Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.....1001 Monadnock Bldg., S. F.
P. F. Howard Co..Folsom and 2d Sts., S. F.
California Steam Plumbing Supply Co., 671 Fifth St., S. F.
Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

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Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

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McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton, Sts., S. F.
Vulcan Iron Works.....S. F.

REVOLVING DOORS
American Revolving Door Co.,
2514 Monroe St., Chicago, Ill.
Van Kennel doors, sold by U. S. Metal Products Co.....525 Market St., S. F.

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Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F.
Wilson's Steel Rolling Doors. U. S. Metal Products Co.,
San Francisco and Los Angeles

ROOFING AND ROOFING MATERIALS
Ames-Irwin Co., Inc.,
Eighth & Irwin Sts., S. F.
Biturine Co. of America,
24 California St., S. F.
F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.,
Rialto Bldg., S. F.
Golden Gate Brick Co..660 Market St., S. F.
Grant Gravel Co.....Williams Bldg., S. F.
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy,
Monadnock Bldg., S. F.
Fibrestone & Roofing Co.,
971 Howard St., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
Mackenzie Roof Co., 425 15th St., Oakland.
United Materials Co.... Balboa Bldg., S. F.

ROOFING TIN
American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.

RUBBER TILING AND MATTING
New York Belting & Packing Co.,
129 First St., S. F.

SAFES, VAULTS, BANK EQUIPMENT
M. G. West Co.....353 Market St., S. F.
Parcells & Cook.....425 Sharon Bldg., S. F.

SAFETY TREADS
Universal Safety Tread Co., represented by Waterhouse and Price, San Francisco and Oakland.
American Mason Safety Tread—See advertisement on page 131 for Coast Agents.

SANDSTONE BRICK
Sacramento Sandstone Brick Co.,
Sacramento, Cal.
Golden Gate Brick Co..660 Market St., S. F.

SANITARY DRINKING FOUNTAINS
N. O. Nelson Mfg. Co.,
978 Howard St., S. F.
Kohler Co.....Monadnock Bldg., S. F.

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Puritan Sash Cord Company. (For Coast Agents, see advertisement.
Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines
88 Broad St., Boston, Mass.
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512 S. Broadway, Los Angeles.

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Neponset Waterproof Building Papers, Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK, SKYLIGHTS, ETC.
Berger Mfg. Co.....1120 Mission St., S. F.
Capitol Sheet Metal Works,
1927 Market St., S. F.
Yager Sheet Metal Co.....Oakland, Cal.
Western Furnace & Cornice Co.,
1645 Howard St., S. F.
U. S. Metal Products Co.,
525 Market St., S. F.

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Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

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The Haslett Spiral Chute Co.,
310 California St., S. F

STEEL AND IRON—STRUCTURAL
Central Iron Works..621 Florida St., S. F.
Dyer Bros.....17th and Kansas Sts., S. F.
Judson Manufacturing Company,
819 Folsom Street, San Francisco.
Brode Iron Works,..31 Hawthorne St., S. F.
Mortenson Construction Co.,
19th and Indiana Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, Agt.,
135 Kearny St., S. F.
Pacific Rolling Mills,
17th and Mississippi Sts., S. F.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, Etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.
Ralston Iron Works,
Twentieth and Indiana Sts., S. F.
Schrader Iron Works .....San Francisco
U. S. Steel Products Company,
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Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Vulcan Iron Works.....San Francisco
Western Iron Works....141 Beale St., S. F.
Woods & Huddart ...444 Market St., S. F.

STEEL BARS FOR CONCRETE REINFORCEMENT
Judson Manufacturing Company, 819 Folsom Street, San Francisco
Kahn and Rib Bars, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Woods & Huddart....444 Market St., S. F.

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Dahlstrom Metallic Door Co., 353 Market St., S. F.

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Ashlock Steel Door Guard Co., Monadnock Bldg., S. F.

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Canton Mfg. Co., represented by Sherman Kimball & Co., First and Howard Sts., S. F.

STEEL STUDDING
Collins Steel Partition. Parrott & Co., S. F.
"Lesco," Metal Stud, Levensaler-Speir, Corporation,.....Monadnock Bldg., S. F.

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Parry Stone Co., "Sanpeta," "Colete," and "Manti" white stone, 417 Montgomery St., S. F.

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S. F. Bowser & Co., 612 Howard St., S. F.

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Mass. Bonding & Insurance Co., First Nat'l Bk. Bldg., S. F.
Fidelity & Deposit Co. of Maryland, Mills Bldg., S. F.
Pacific Coast Casualty Co. Merchants' Exchange Bldg., S. F.

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Gladding-McBean Co....Crocker Bldg., S. F.

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Watson Mantel & Tile Co., Sheldon Bldg., S. F.
John Petrovffsky.....523 Valencia St., S. F.

TILE FOR ROOFING
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Gladding, McBean & Company. Crocker Bldg., S. F.
United Materials Co.....Balboa Bldg., S. F.

TIN PLATES
American Tin Plate Company, Rialto Bldg., S. F.

VACUUM CLEANERS
Bill & Jacobsen.....Rialto Bldg., S. F.
The Vak-Klean Vacuum Cleaner, Pneulectric Co., Pacific Coast Agts., 452 Larkin St., S. F.
Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., S. F., and 3d and Jefferson Sts., Oakland.
"Tuec" Air Cleaner, manufactured by United Electric Co.....110 Jessie St., S. F.

VALVES
Jenkins Bros.....247 Mission St., S. F.

VALVE PACKING
"Palmetto Twist," sold by H. N. Cook Belting Co.....317 Howard St., S. F.

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W. P. Fuller Co.....All Coast Cities
S. F. Pioneer Varnish Works, 816 Mission St., S. F.
Moller & Schumann Co., Brooklyn, N. Y., Chicago and S. F.
Berry Bros., "Liquid Granite," mfrd. and sold by Berry Bros..250-256 First St., S. F.

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C. F. Weber & Co....365 Market St., S. F.

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Marshall & Stearns Co., 1154 Phelan Bldg., S. F.

WALL BOARD
Levensaler-Spier Corporation, Monadnock Bldg., S. F.
"Plastergon," sold by Comyn-Mackall & Co., 310 California St., San Francisco.

WALL SAFES
Lowrie Wall Safe, sold by C. Roman Co., 173 Jessie St., S. F.

WATER HEATERS
Pittsburg Water Heater Co., 237 Powell St., S. F.
Beler Water Heater Co., 1758 Broadway, Oakland

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Concrewaltum, made by Gobeen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Concrete Cement Coating, manufactured by the Muralo Co. (See color insert for Coast distributors.)
Fibrestone & Roofing Co., 971 Howard St., S. F.
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Neponset Waterdyke Felt and Compound, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co. .....Rialto Bldg., S. F.
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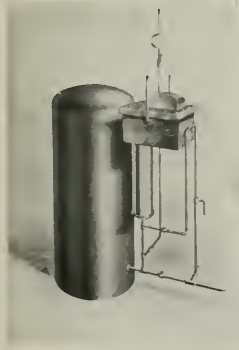

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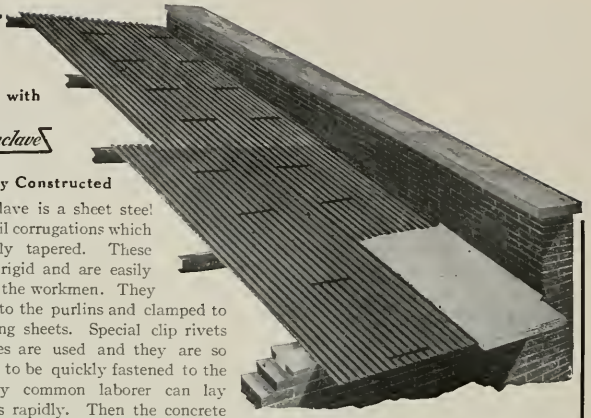

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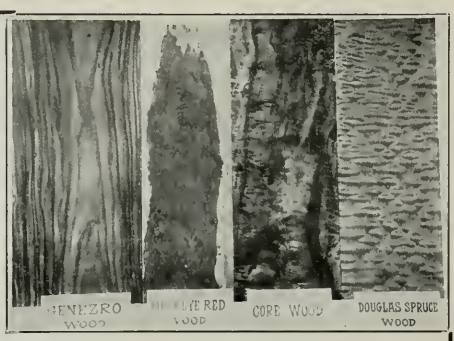

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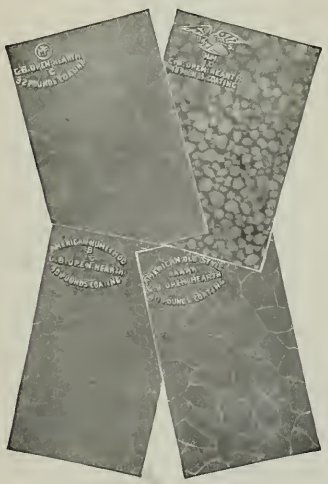

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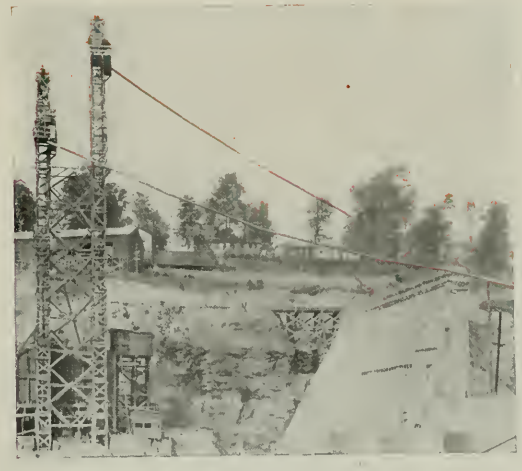

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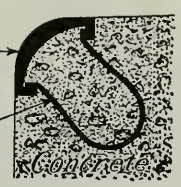

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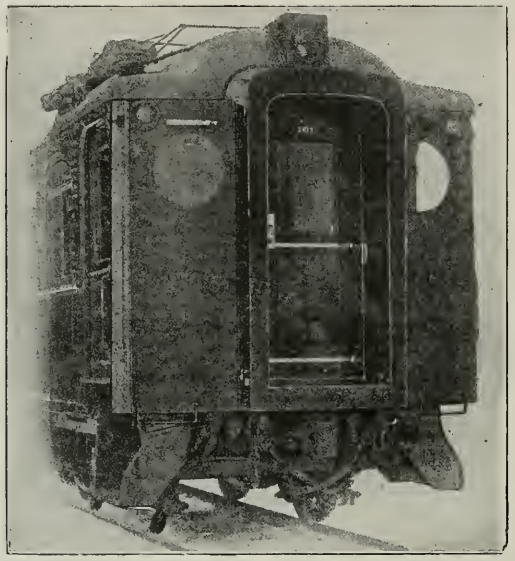

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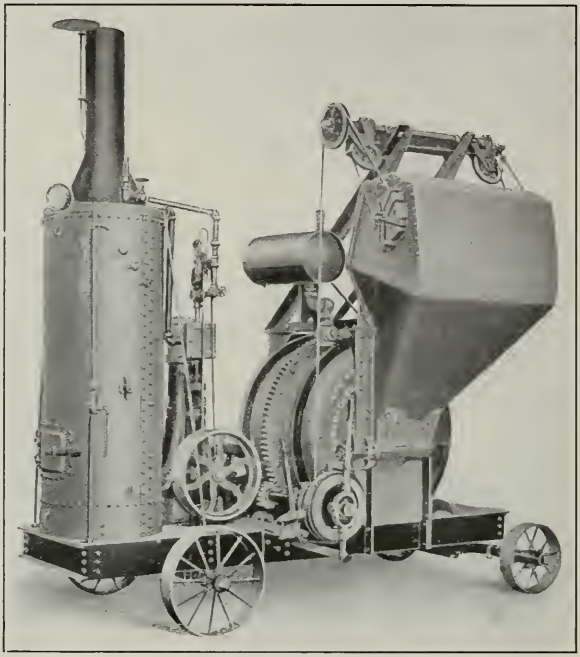

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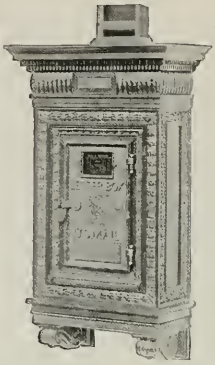

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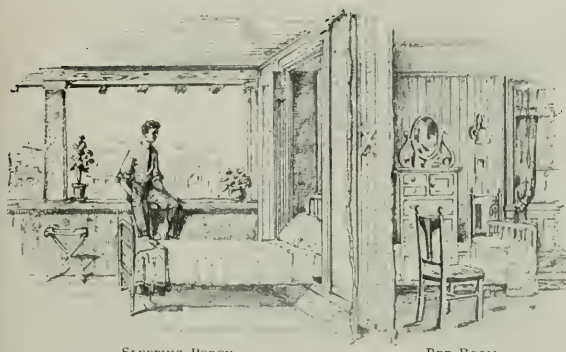

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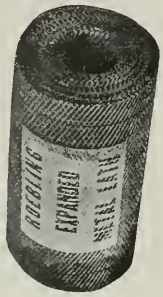

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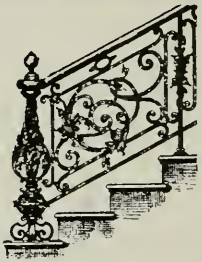

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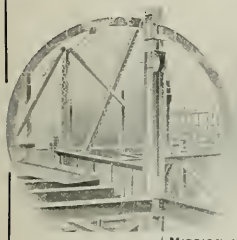

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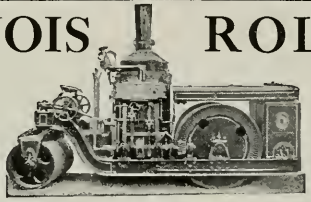

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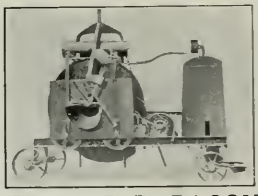

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Issued monthly in the interests of Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast.

Entered at San Francisco Post Office as Second Class Matter.

A Merry Christmas

Contents for December

	PAGE
Entrance Court, Residence of Mr. J. B. Crowley, *Righetti & Headman, Architects* — *Frontispiece*	
The Recent Work of Messrs. Righetti & Headman, Architects	47
Some Suggestions on Estimating — *Henry A. Hoyt*	73
The Quantity Surveyor—Who Pays Him for His Services?	76
A Plea for Greater Freedom—Independence if You Will—in Architectural Design — *W. R. B. Willcox, Former Pres. Seattle Chapter, A. I. A.*	77
Los Angeles' New Depot	84
The Bungled Bungalow — *William Schultz, Architect*	85
Anent the Portland Postoffice Competition	91
Reminiscences of a Brick Man — *Charles H. Frost, Director Los Angeles Pressed Brick Co.*	95
Heavy Concrete Dam Construction — *J. A. Bried* — First Views Shown of the Pacific Gas & Electric Company's Lake Spaulding Project	98
Building a House in a Day	104
The Steel and Iron Industry of California. V.—The West Coast Wire and Iron Works	105
Among the Architects	111
Editorial	114
Municipal Engineering	116
Heating and Lighting	119
By the Way	126

(Index to Advertisements, page 8)

ENTRANCE COURT. RESIDENCE OF MR. J. B. CROWLEY

West Clay Park, San Francisco — *Righetti & Headman, Architects*

Frontispiece
The Architect and Engineer
of California
December, 1913

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XXXV. DECEMBER, 1913. No. 2.

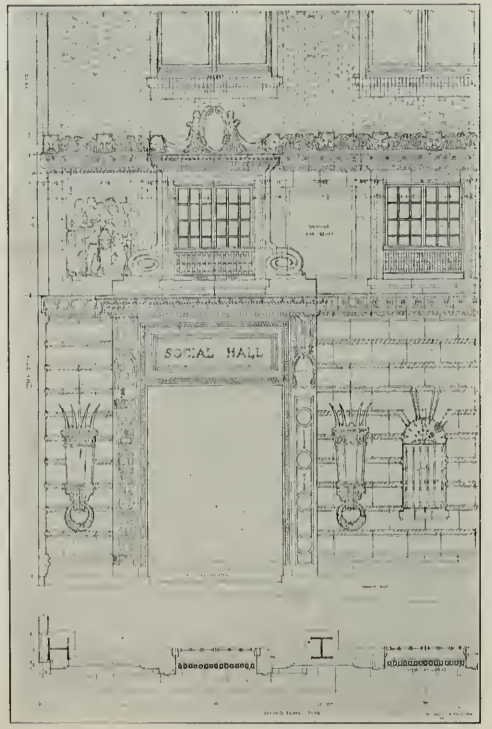
The Recent Work of Messrs. Righetti & Headman, Architects

IN THE work of Messrs. Righetti & Headman of San Francisco, shown in the accompanying pages, the reader will find a predominance of commercial designs that are quite a little better than the average. The architects have accomplished things that must be very gratifying both to themselves and their clients. They have given us a pleasing architectural treatment without sacrificing the practical end. In other words, they have furnished their clients with the most possible for the amount expended and have succeeded in providing something that would produce an income. The most satisfied client is he who finds himself the possessor of a good investment. If the building has been designed and built with this idea in mind, the architects may be said to have achieved success.

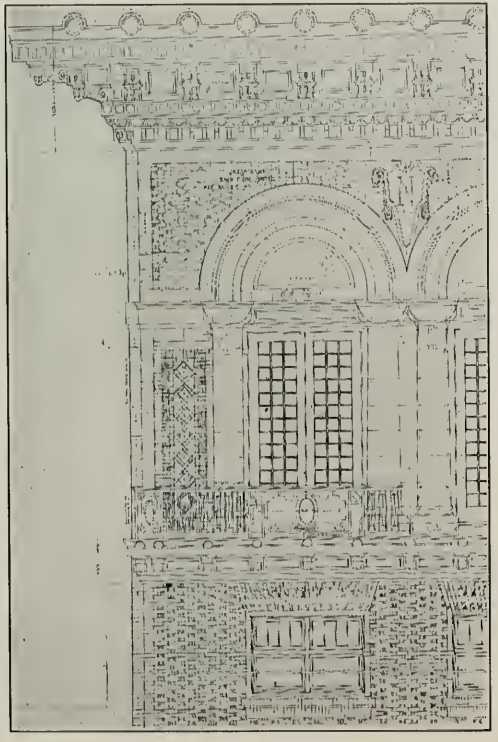
Every problem has required its own solution, and the same careful study has been given the design of a flat or residence as has characterized the preparation of drawings for an apartment house or hotel. No one school of architecture has been followed; in fact, the tendency has been to keep away, insofar as possible, from the old Roman period. The architects have endeavored to give faithful expression to their interpretations and have done it in their individual way.

In the matter of competition work Messrs. Righetti & Headman have enjoyed more than the average success. The splendid Native Sons' building on Mason street, towering well above the other structures in that locality, speaks eloquently of the firm's capacity for handling the more pretentious class of work. Associated with them in this undertaking was Mr. E. H. Hildebrand, who was Mr. Headman's classmate in the University of Pennsylvania.

In the Olympic Club competition the firm was awarded fourth prize, while honorable mention was given their competitive drawing for the Portland Auditorium. Second prizes were awarded them in the San Francisco City Hall and Alameda County Infirmary competitions. Much of their private work also has been secured on the competitive basis—the merit of their sketches being quickly recognized by owners who, first of

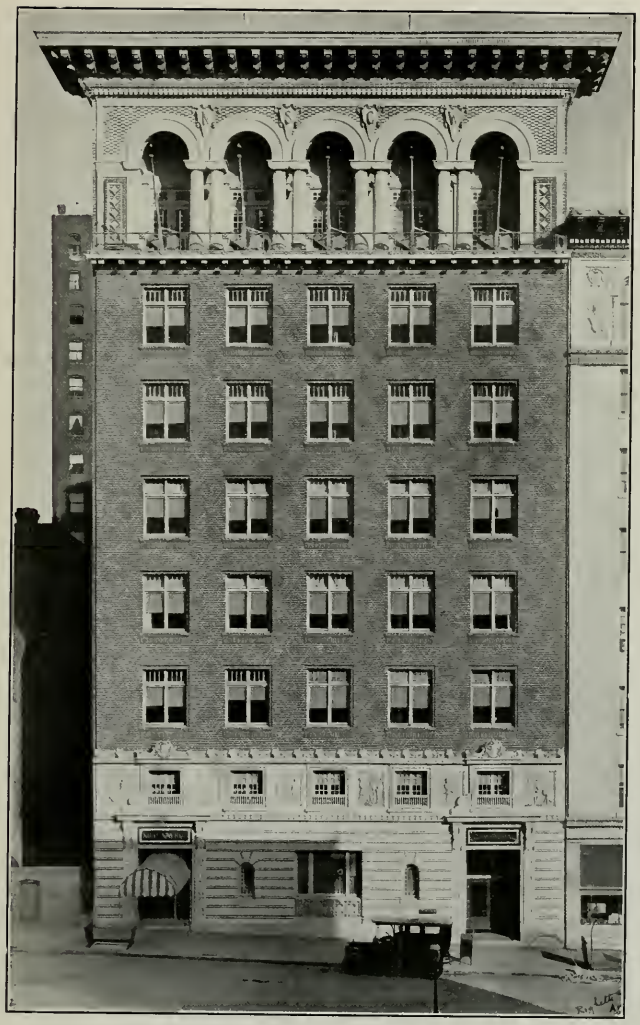


Entrance Detail

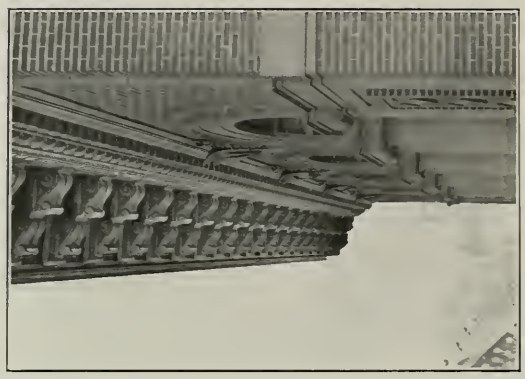


Top Story Detail

Native Sons' Building, San Francisco

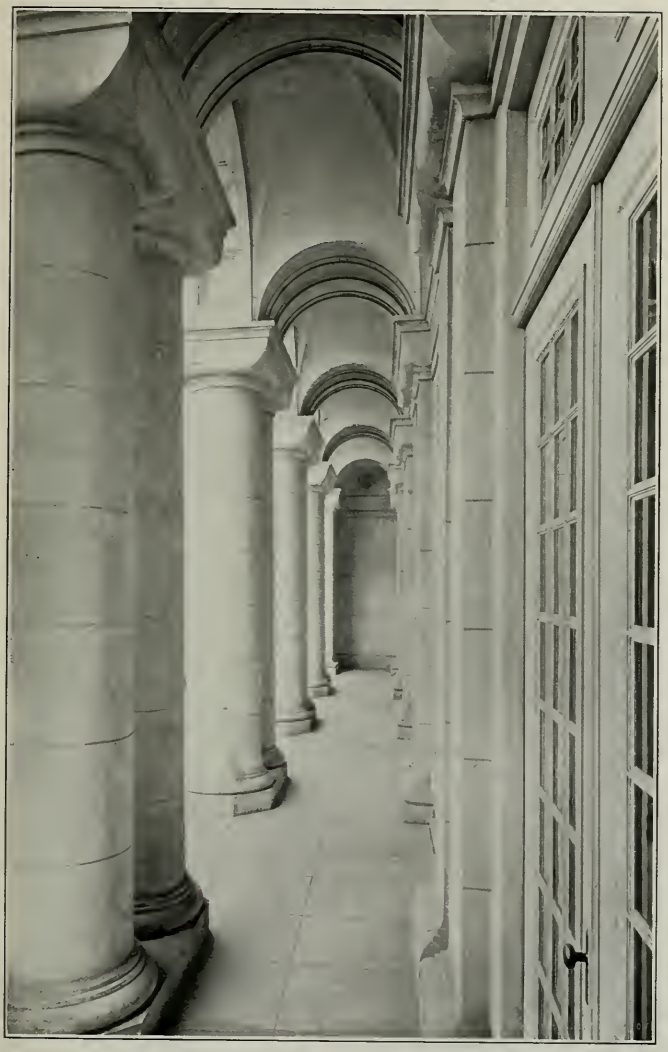


Native Sons' Building, San Francisco
Righetti & Headman, Architects
E. H. Hildebrand, Associate



Detail Main Cornice, Native Sons' Building, San Francisco

Corner of Ball Room and Auditorium, Native Sons' Building



Cloister, Native Sons' Building, San Francisco

Women's and Gentlemen's Parlor, Native Sons' Building

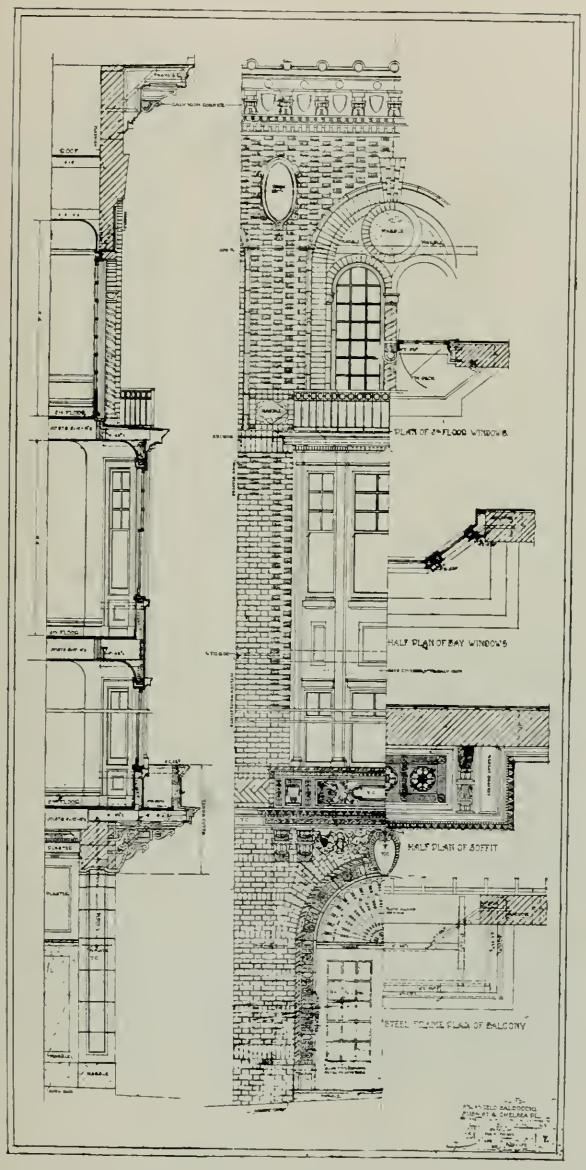
Women's Drawing Room, Native Sons' Building

Angelus Apartments, San Francisco
Righetti & Headman, Architects

all, want to be shown to what extent the building can be made to produce an income.

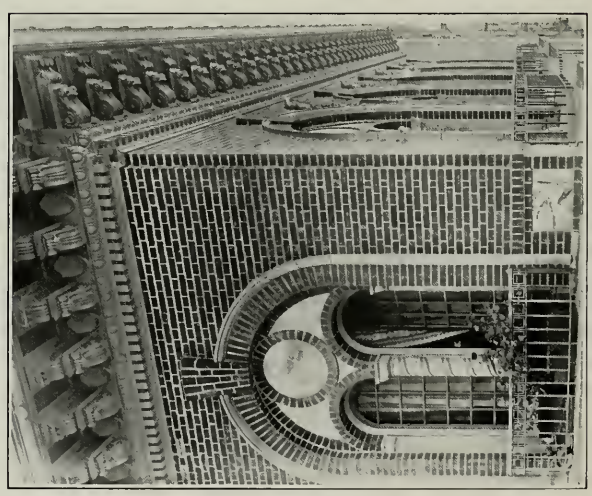
The partnership of Righetti & Headman was formed in 1909, the senior member of the firm, Mr. Perseo Righetti, having formerly been associated with the late H. P. Kuhl. Both Mr. Righetti and Mr. Headman are members of San Francisco Chapter of the American Institute of Architects and Mr. Headman was the organizer and first president of the San Francisco Architectural Club.

Detail Entrance Angelus Apartments
Righetti & Headman, Architects

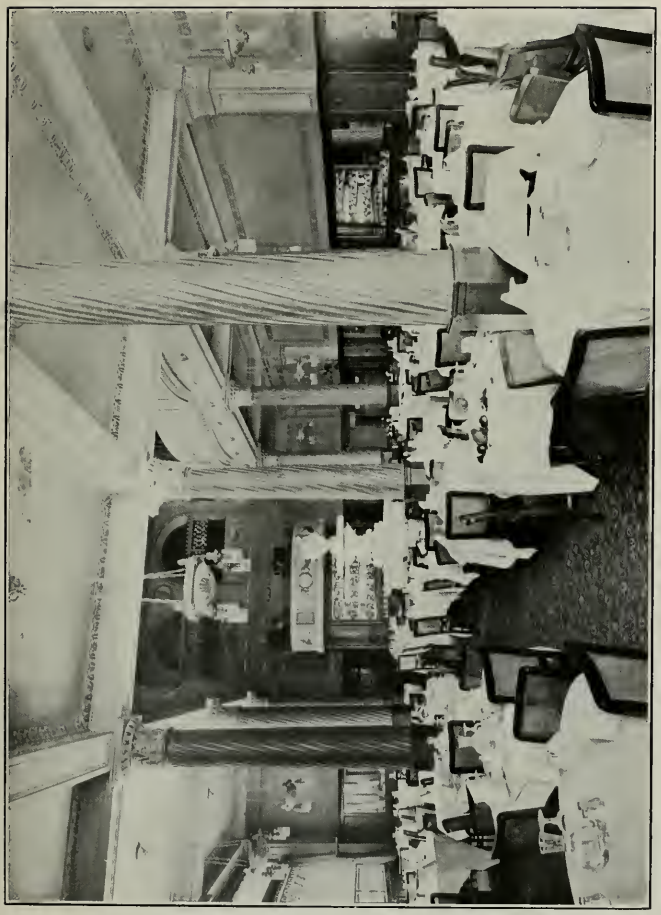


Scale Detail, Angelus Apartments, San Francisco

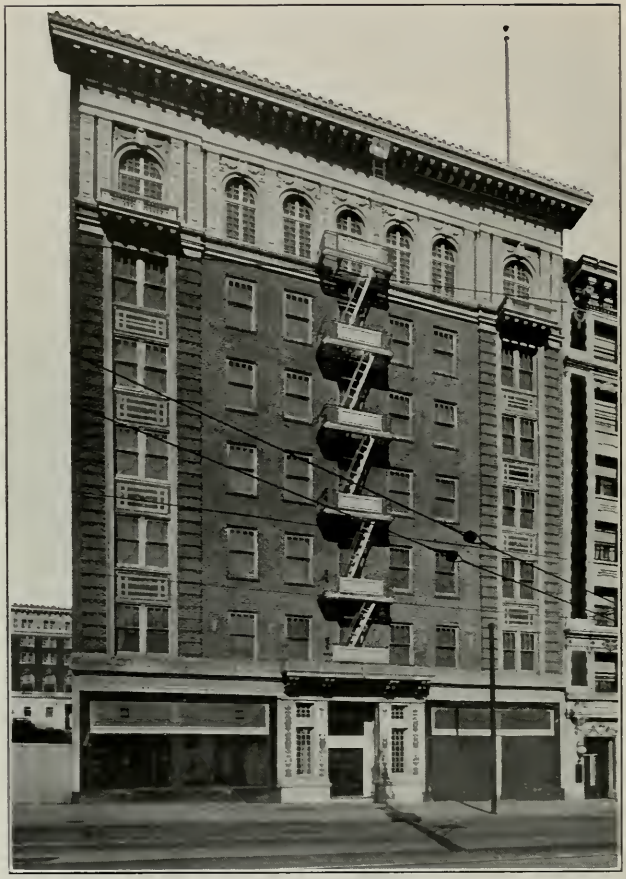
Hotel for Mr. G. Orsi, San Francisco
Righetti & Headman, Architects



Detail Top Story, Angelus Apartments



Cafe for Mr. Fred Solari, San Francisco
Righetti & Headman, Architects Modeling and Plaster Work by Menzer & Menzer
Lighting Fixtures by Leo. J. Meyberg Company



Metcalfe Hotel, San Francisco
Righetti & Headman, Architects
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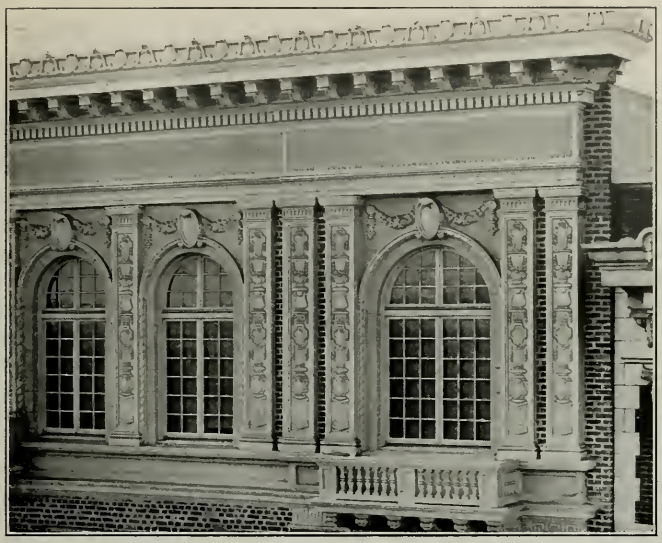
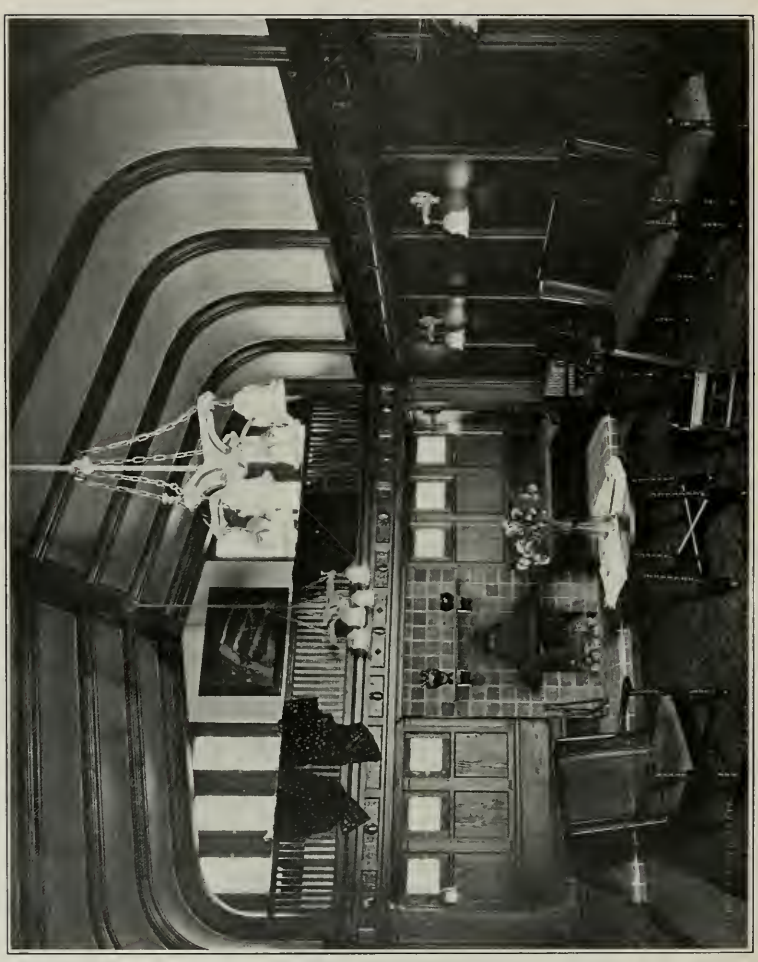


Detail Upper Story, Metcalfe Hotel, San Francisco

Entrance, Metcalfe Hotel, San Francisco
Righetti & Headman, Architects



Lounging Room, Maryland Hotel, San Francisco
Righetti & Headman, Architects

Maryland Hotel, San Francisco
Righetti & Headman, Architects

Lastreto Double Residence. San Francisco
Righetti & Headman, Architects

Living Room, Residence of Mr. Emilio Lastreto, San Francisco
Righetti & Headman, Architects

Dining Room, Emilio Lastreto Residence, San Francisco
Righetti & Headman, Architects

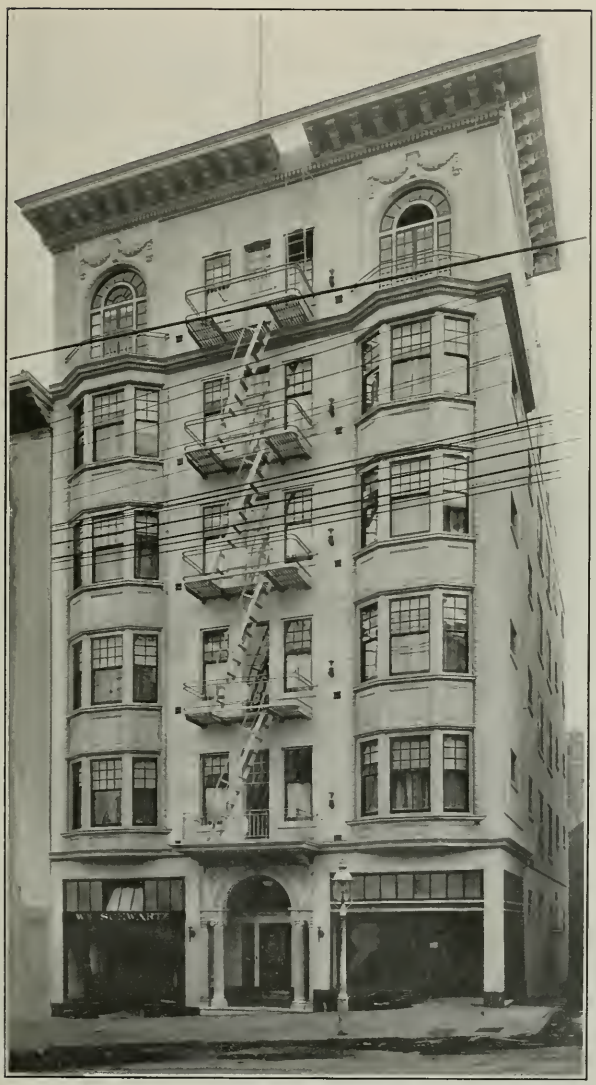
Hotel Essex, San Francisco
Righetti & Headman, Architects

Building for Frapolli Estate, San Francisco
Righetti & Headman, Architects

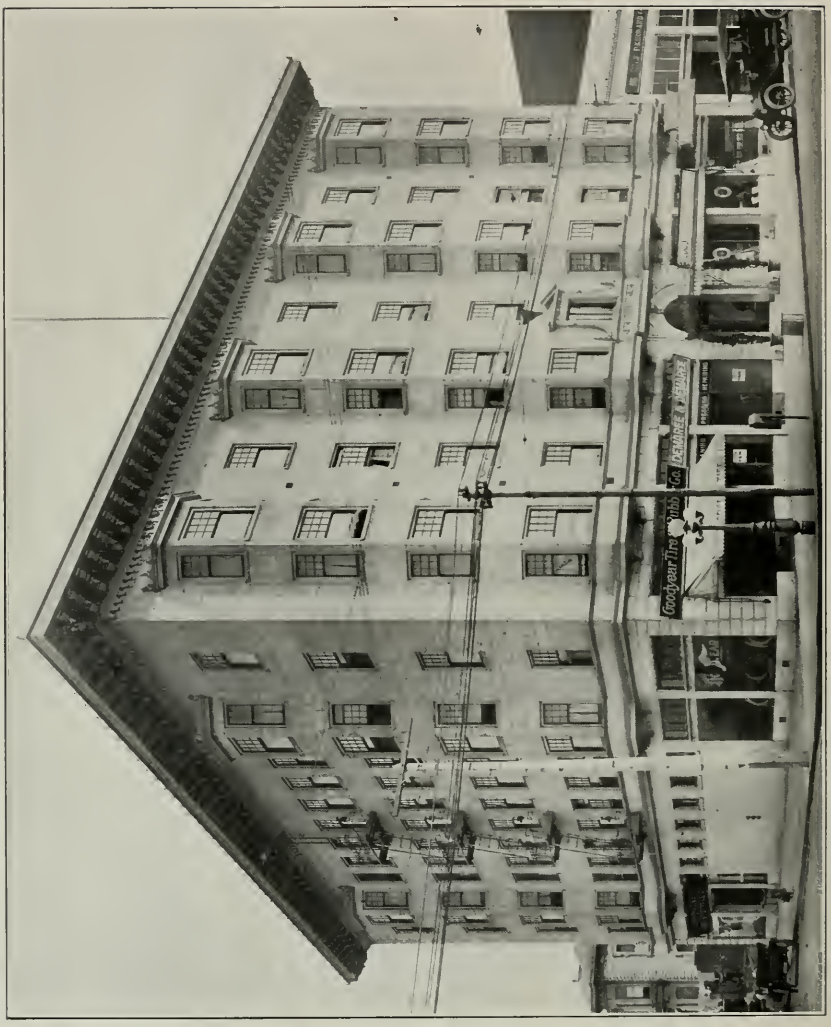
Double Residence for Dr. J. E. Artigues, San Francisco
Righetti & Headman Architects

Flats for Mr. Jean Allec, San Francisco

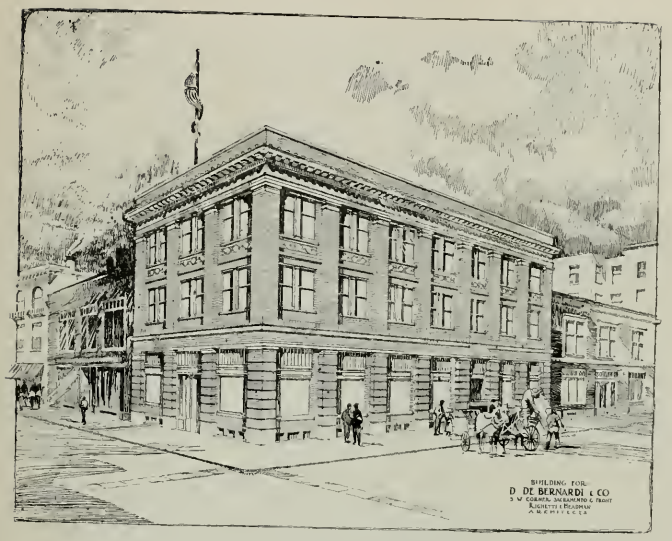
Entrance to Apartments of Dr. T. J. Crowley and H. P. Stoltenberg
Righetti & Headman, Architects



Apartment House for Dr. T. J. Crowley and H. P. Stoltenberg, San Francisco
Righetti & Headman, Architects



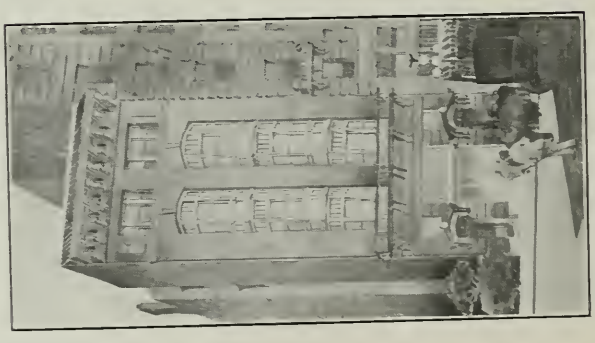
Bauer Apartments, Oakland — *Righetti & Headman, Architects*



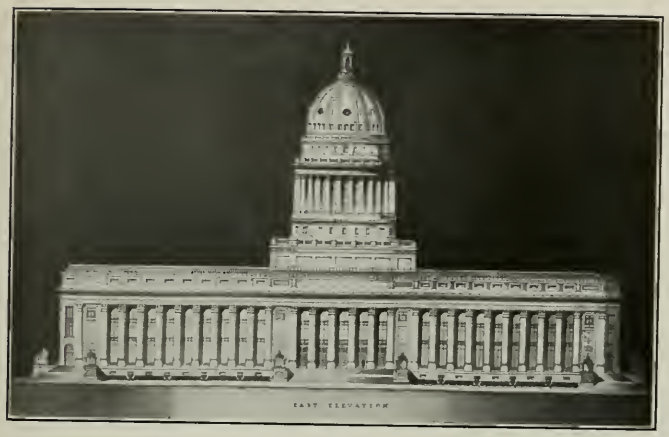
Building for D. De Bernardi & Co., San Francisco
Righetti & Headman, Architects

First National Bank Building, Medford, Oregon
Righetti & Headman, Architects

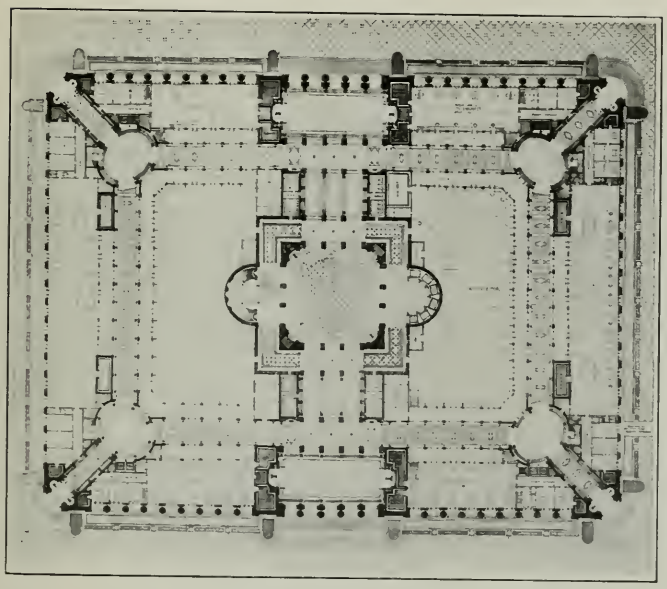
Design for Group of Residences
Righetti & Headman, Architects



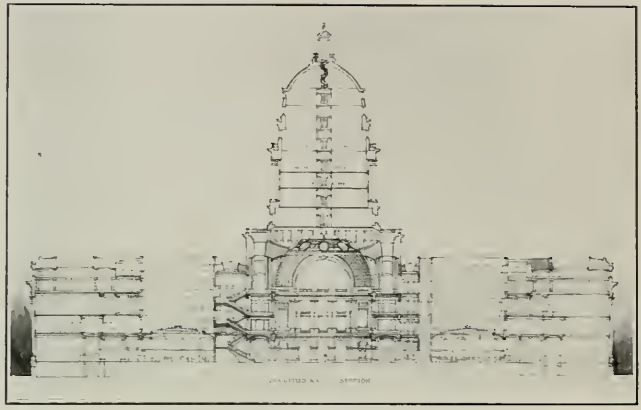
Hotel for the Benedict Estate, San Francisco



East Elevation, San Francisco City Hall Competition. Awarded a Second Prize
Righetti & Headman, Architects



Ground Floor Plan
Righetti & Headman, Architects



Section, San Francisco City Hall Competition

Competitive Design for Alameda County Hospital Group. Awarded a Second Prize
Righetti & Headman, Architects

Some Suggestions on Estimating

By HENRY A. HOYT

ALL contractors are by necessity estimators. Either they estimate the cost of building construction themselves, or, in the case of larger concerns employ estimators, or "quantity surveyors," as they are known across the water. In either case, the final success of a building contract depends vitally on two results—first, getting a price for it, and second, erecting the said building for the said price, plus the desired margin.

Recently a card has been circulated in building circles bearing a sort of advertisement, and on one side the following: "Contracting, Like Horse Racing, is Due to Different Opinions." Usually the "different opinion" is the direct result of great differences in the method and manner of estimating the cost of construction. It is probably a fact that no two contractors prepare estimates and recapitulations of materials and labor in the same manner. This is not necessary always, but some system or near-system should be employed. Most of us have seen the picture entitled "The Successful Contractor," showing a builder at his desk, deep in thought, hand in his hair, and supposed to be saying, or at least thinking, "What did I forget?" This, unfortunately, is too often true. The writer has seen successful estimates prepared on slips and scraps of paper and used envelopes and the like, but the element of success and certainty involved would have been more secure, and at least more satisfactory had more system been used. It is of secondary importance, the kind of system adopted; in fact, it is just as bad to over-systemize the business of estimating till the system eventually swallows up the business in the deadly overhead expenses. One very well-known general contractor of the city of San Francisco uses large blank books, weighing many pounds (and incidentally he also weighs many pounds), and everything is kept in this book, even to the minor figures used to get off the quantities. It finally resembles a school boy's scratch pad. Another well-known contracting engineer of San Francisco, a man of a vast amount of experience, keeps everything pertaining to one estimate in a heavy, large manila envelope, and these are filed away eventually by name and number. A certain well-known contractor in the interior of California uses a large "I-P" loose-leaf book, and invariably carries it around the State with him wherever he goes. He became known to several of us as the "black book man." Another interior contractor once made up his figures in a certain school competition in the lobby of the local hotel, wrote out his bid and walked away, leaving his estimate sheet on the hotel desk. One of his competitors walked off with it and then cut his own estimate. Very foolish and careless of both of them, but it so happened that neither of them got the contract. One contractor on a large public building competition in southern Oregon had his bid neatly typewritten on his stationery with the space for the final amount left blank. This he filled in at the desk of a local bank and carefully blotted the amount with a new blotter. Soon another contractor sought out the same place to fill out his bid and learned the amount of the first man's bid from the blotter, mirror, etc. Sounds "fishy," but it's true. All of the foregoing are incidental reminiscent experiences only and show the great diversity of methods employed by builders. Probably more errors creep into estimates, especially errors of omission, by the use of printed estimate forms. No two buildings are sufficiently alike to permit of this form or blank

being a success. Many of the printed items will be used on one building and not on the next, and if you place no figures after an item not involved in the structure in question, you are very liable to omit some figures from some other item of vital importance to your recapitulation. This opinion on the "printed blank" question will be disputed by some good estimators.

When you get a set of plans to bid and estimate from, first make one person responsible for the recapitulation of the estimate. Let that person read the entire specifications through, examining the plans meanwhile carefully and explicitly. Then make up a full and complete tabulation, synopsis or recapitulation, and have it so correct that you can depend on it as final, knowing that when all items are filled in and carried out the estimate will be complete. The correct way to take off the estimate is "as the building would be built." Always remember "order is heaven's first law," and make out your estimate in its regular order. Some make up the estimate alphabetically, but "elevators" and "excavations" are rather far apart in the usual order of building erection. Decide early what portions of the work sub-bids will be asked upon, and even if sub-bids are taken, "take off" the same yourself if you have time and are sufficiently capable. Get several bids on each item asked for if possible. It is hereby respectfully admitted that the ideal method is no sub-bids on anything till after you get the contract signed for the job, but as long as present methods of contracting exist on this coast sub-bids will continue to be invited and used by general contractors as a class. Make mental or written notes of errors or omissions in drawings or specifications, and if serious, take it up at once tactfully with the architect, but do not take up minor discrepancies with him that would make no difference with your estimate. Your time should be worth as much as his, possibly more.

Checking up all quantities and minor figures in an estimate should not be necessary if the work has been well and conscientiously performed. There are many differences of opinion on this item of re-checking one's estimate, but if many jobs are figured it is enough work to estimate once. (One estimates for nothing enough usually.) If the estimate is expected to be re-checked one gets into the serious habit of depending too much upon the said re-checking. The crucial test of a contractor's fitness for his work is his ability to handle men and operations successfully, but second only in importance is his ability to estimate the probable cost of construction. These two qualifications are not usually found in one man, but if so found he should make a successful contractor. Often successful contracting firms consist of two persons—one whose special aptitude is organizing and handling men, and another whose natural bent and training fit him to estimate costs, keep records, compile statistics and cost systems, and to act with his partner in an advisory capacity on business and buying matters. This ideal combination originates usually from a good foreman and a young civil engineer.

Evidently the building business had its drawbacks and failures early in the history of the world, else the following would not have been a seemingly necessary precept of Holy Writ: "For which of you, intending to build a tower, sitteth not down first and counteth the cost, whether he have sufficient to finish it? Lest, haply, after he has laid the foundation, and is not able to finish it, all that behold it begin to mock him, saying, 'this man began to build and was not able to finish.'" This would probably be the experience of many an owner were it not for the bravery

and courage of the average contractor, who "sitteth down first and counteth the cost," and then "puts up a bond and takes all the chances."

It is convincing that many low bids, and high ones too, for that matter, are, as Dr. Johnson says, "the result of sheer ignorance" as much as a desire in the face of common experience to prove that two and two equal five. Very seldom are serious mistakes made when one follows his own good judgment. There is no such thing as time in proportion to cost in estimating. On some buildings an estimator might spend three or four days on millwork alone, while on another a few hours would suffice. A thousand dollars of hardware might occupy as much time to take off as ten or twenty times that amount in brick or concrete work. Always keep the sub-totals of your estimate separate and complete in themselves. You can then always with safety alter or change price or quantity without making a risky change clear through the estimate.

Some contractors add the profit desired to each item or sub-heading; this is wrong practice; get the exact cost and add "all the profit at once." Never under any circumstances base your final proposal on an estimated cost given by the architect or engineer in charge of the job. Many times this pre-estimate is correct in quantity, but not in price; often the reverse is true. Depend upon yourself and not the other fellow. Also be your own price maker, even if your estimate is made up by an employe. The diversity of figures of sub-contractors requires your best judgment always. It is not always wise to use the lowest sub-figures you are offered, even if the low man is presumed to be entirely responsible. It usually leads to trouble and dissatisfaction later. Avoid verbal sub-bids, and be sure that bids tendered read "according to plans and specifications." Do not use figures based on quantity lists other than your own when your contract is over the plans and specifications.

Be very careful of making up estimates from some of the estimate books published. There are a large number of them that are of valuable assistance, but entirely inadequate for the constantly changing conditions and prices of the building industry. Be your own estimate book as far as you can and keep a clear record of costs. All of the foregoing suggestions and experiences are somewhat rambling and desultory, but may prove of more than passing interest to other contractors.

Several years ago there appeared in this magazine a summing up of the general qualifications of a contractor, taken from a speech of a prominent New York City contractor, and the wording was so true, so real, and so worthy, that it will readily bear repetition here: "There is no class of work that takes as varying qualities or so many qualities as contracting. It appeals to men who are optimistic and to those who have born in them the longing for doing things. The contractor must be a man, first, of that most uncommon thing, common sense; and he must have physical sense, the sense that tells a man without calculating where lies the center of gravity; the sense that tells a man values without estimating, the sense that tells a man quantities without measuring. He must have magnetism in order to gather his men about him. He must have reputation for justice in order to hold them. He must be forceful in order to inspire energy in others. He must be a lawyer and a buyer. He must have the ingenuity of the inventor, and the grasp of the field marshal. He must be a diplomat and he must be a politician. He must also know when not to be a politician. He must be a financier, and I regret to say, in these days, an advertiser, and he must be a prophet." And the writer most respectfully adds to the opinion of this eminent contractor the words, "and then some."

The Quantity Surveyor—Who Pays Him for His Services?

THE QUANTITY SURVEYOR, a monthly bulletin issued, it is stated, "under the auspices of the American Institute of Quantity Surveyors," has for its avowed mission "the promotion of better methods of stimulating and dealing with bids."

That there is need for reform is conceded by all familiar with conditions, but it is essential that errors of principle be carefully avoided where a new practice is going through a formative process. For example: Under the heading of "Correspondence" in the September issue of the Quantity Surveyor, the question is asked:—who pays the quantity surveyor for his services? This is a question that in the movement to create a new personality in building operations will at once suggest itself to every architect. The reply is printed as follows:

"The architect selects the quantity surveyor and agrees with him what his percentage is to be upon the contract price, according to the class of building required. At the end of the bill of quantities will always be found a summary of all the different trades covered by the bill, and at the foot of the summary, after the total has been arrived at, the following will appear:—'add to the above total—per cent upon the total amount of same, to be paid to the quantity surveyor by the contractor, out of the first payment received.'"

It therefore becomes apparent that the quantity surveyor will be directly in the pay of the contractor but will be selected by the architect.

All this is very definite as far as it goes, but, as is well known, very many proposed buildings never pass the estimating stage. Estimates are too high, or for some other reason no contracts are let. Who then, asks the American Architect, pays the quantity surveyor, or is he in the same position that the contractor finds himself in under similar circumstances in present practice?

Would it not be wiser to place the quantity surveyor directly in the employ of the owner the same as the architect is?

The owner pays the quantity surveyor his fee in any event if it is paid, and by doing so directly, instead of through the contractor, a very obvious objection would be removed.

* * *

A. I. A. Convention at New Orleans

ONE of the surprises at the recent annual convention of the American Institute of Architects held in New Orleans was the election of D. Knickerbacker Boyd as secretary in place of Glenn Brown, who had filled the position for years, and was looked upon by many as a permanent fixture. It is said Brown was not in sympathy with the progressive element which controlled the convention. Since the Institute began the publication of the Journal Mr. Boyd, as chairman of the Publicity Committee, has been a dominating spirit in the affairs of the organization.

The delegates discussed the repeal of the Tarsney Act and passed a resolution in favor of placing all important government work on a competitive basis. An amendment providing for affiliation with the Institute of architectural societies other than chapters, was defeated by a substantial vote.

Following is a partial list of officers elected: President, R. Clipston Sturgis of Boston; First Vice-President, Frank C. Baldwin of Detroit; Second Vice-President, Thos. R. Kimball of Omaha; Secretary-Treasurer, D. Knickerbacker Boyd.

The matter of the 1914-15 convention was left to a special committee.

A Plea for Greater Freedom Independence if You Will in Architectural Design

By W. R. B. WILLCOX, Former President Seattle Chapter, A. I. A.

Here is a most interesting discussion of a subject that will at once appeal to every member of the architectural profession. What architect has not at some time in his career, be it ever so modest, yearned for that opportunity to design and to build with a free hand—unrestrained by influences of practice and unhampered by the exasperating restrictions of the client? Is it any wonder that the architect, he who is so fortunate as to be able to build something of his own, designs for himself what he never would dare to design for the layman? An odd-looking house, you say! But to the man who designed it it means everything—beauty, character, comfort—the final realization of his own dreams of an ideal domicile. But let Mr. Willcox tell you more in his own scholarly way:

Mr. W. R. B. Willcox

NOT many years ago an architect friend was showing me a house he had recently built for himself, and after reviewing the peculiar conditions he had tried to meet, as if conscious of some possible peculiarity, remarked: "It seems good for once not to be practicing architecture." "What were you doing?" I asked. "Don't you call that architecture?" Evading the question, he replied, "My sister calls it downright ——." I leave it to you to picture in your minds what an interesting house it was.

But the conversation seemed to hold a subtle inference that the conditions of architectural practice are somehow inimical to a straightforward solution of present-day problems, or that simple, direct treatment of economic and structural needs does not produce the kind or quality of architecture generally aimed at in actual practice. What, then, are the conditions of the "practice" of architecture, as we regard it, which seem to admit of a feeling that, although a building combines with poetry, adaptation to purpose, discriminating choice of materials, pleasing proportions and shapely outlines, it somehow is independent of those very conditions?

Here was a building which united practical and aesthetic qualities, and yet there was something about it which, at least in the mind of its author, seemed to place it outside the category of works which are commonly recognized as products of the practice of architecture. Why was this so? I was aware that my friend was not thinking of the mechanical part of practice, which, in his own case, was not different from that of the average client; nor reflecting upon the difference that in his own case he received no money remuneration, since there would be no particular reason for rejoicing over that circumstance. He seemed to be expressing a reckless delight at having, for a time, rid himself of some vague, hampering restrictions, at having indulged in an unpermitted freedom.

Was this sense of freedom in the nature of release from the exactions of the usual client, his special and often incongruous requirements; or of escape from the difficulties of making a few thousand dollars cover a multitude of essentials; or of absence of the need of effecting a practical

compromise between the accommodations required, peculiarities of site, cost and the like? Certainly, all these chains bound him in the pursuit of his own ideal domicile. To my mind it was freedom of another sort, a freedom which is enjoyed by almost every architect when he undertakes to build a house for himself. He had realized an opportunity to do just as he pleased without thought of conforming to any conventions whatever.

It is probably due to an abandon of this kind that architects' houses so often seem "odd" to the layman. I have known several such instances and often have heard the question asked, "Why do architects build for themselves houses so unlike those they build for other people?" We do a considerable amount of talking about building to fit the owner, insisting that a house should have a note of individuality which should be indicative of his peculiar traits, but if, really, we acted oftener upon that principle there would, I think, be a greater freshness and distinction in the work of present-day practitioners and greater diversity in the character of buildings; the matter of "style" would be less marked and an added interest would invest architecture.

Certainly architects differ not widely, in the ways of life, from other people among whom they live. They give themselves to work and play, to reflection and friendship, about as others do. If they differ from other people it is only in respect to the more personal traits and habits in which they differ from each other. But in building for themselves their work reflects more sharply those personal differences than it does the difference between their clients when building for them. In the latter cases is noticeable a more or less settled conformity to types or "styles." The same types recur endlessly in connection with clients of widely different traits and habits, education and environment. We all know what they were.

An acquaintance, glancing through an architectural journal the other day, happened upon a picture of one of the familiar types and exclaimed, "Why don't architects give us something new? I've seen that sort of house ever since I was born!" Now, it is a simple thing to say that people come to us for houses of this or that kind and we try to give them what they want, but that does not relieve us altogether of responsibility, unless we refuse all blame for what they want. Have we not had clients who impressed us as wanting something they really did not particularly like? Just as those who twenty years ago played tennis when they did not particularly enjoy it because it was quite the fashion, and now play golf although they do not altogether enjoy it, for the same reason—so I think our clients are apt to want to have their buildings conform to one of the prevailing fashions, whether they really like it, or whether it is particularly adapted to their needs, or not. And we are glad to accommodate them; it relieves us of the necessity of pushing an analysis of their personal and family characteristics, and those of site, to such limits as is necessary to establish the fundamental facts upon which a truly creative design is based; it puts upon them the onus of fitting themselves to their houses.

As a consequence architectural fashions result in as many, and as deplorable, misfits as does fashion in dress. Sometimes a fashion fastens upon a single feature. In such cases, the ingenuity of the architect is taxed to the utmost—if he does not give up in despair—to disguise it in such a way that it may not violate the purity of the adopted "style" to

which, originally, it was a stranger. I have known a fashion for a certain kind of bay window to spread through a community like the plague. No new house could by any chance be built without one, and old houses had to be altered to accommodate them whether or not they served a useful purpose. The sleeping porch furnishes a present case in point. Whether or not it supplies the needs, or serves the habits, of a household, whether or not it lends itself to our predetermined "style," it must be included in the scheme of things. But bay windows and sleeping porches, being minor details, must not be permitted to affect the general character of prevailing fashions; rather must they be engrafted upon them with such provision for concealment as the circumstances and the imagination of the architect will permit.

Now, while all possible fashions are not in vogue at the same time, they are very well known; they are all embraced in the historic styles of architecture, and if one is to confine himself to the decorous "practice" of architecture his range is really limited to them, for so far as such practice is concerned, architecture is regarded as an exhibit of the various styles of building known to man, the last of which was evolved a few hundred years ago. Beginning with ancient Egypt we find that the various races and periods have supplied each its special contribution—Persian, Assyrian, Grecian, Roman, Saracen, Byzantine, Romanesque, Gothic, Renaissance, etc.—and while certain quirks in each are accorded distinctive names, the exhibit is complete. Pictorially, it has been preserved in collections of photographs and plates which have become important articles of commerce and ever ready aids to the practice of architecture. Figuratively, it is like a box of colors which one may open to find all the various pigments. If one has a degree of skill and daring, he may combine them in a chromatic effect with more or less success, but with liability of severe criticism, while if he would lessen the chance of harsh judgment he will limit himself to monochrome.

So, as architects, we have convenient access to all the models comprising the exhibit of architecture. If of the stripe of genius we may combine them and possibly escape anathema; if of lesser breed we would best devote ourselves studiously to one at a time. Rank in our profession is often established by our apparent knowledge of "complete architecture," and upon our facility, ingenuity and accuracy in adapting the models there of record to the very unlike and infinitely more complicated requirements of our time and people. To ignore or disregard the limitations of this repository invites judgment of us as unscholarly, and brings upon us the pity, if not the contempt, of our fellows and the initiated among laymen.

This is no light matter. We shrink from exposure to such sentiments, and therefore we try to control our emotions; oh, we become very self-conscious! Efforts at composure and nonchalance preoccupy us. Fear of ridicule and desire for the approbation of our professional brethren, far more often than that of the public, combine to discourage sallies beyond the confines of accepted precedent. Timidity and vanity restrict our freedom—so long as we "practice" architecture. It is only in certain circumstances—such as doing a little architecture for ourselves, or for some sympathetic friend—that we claim a tacitly granted exemption from the application of the standards of practice, or defiantly snap our fingers at its cramping conventions.

While I have dwelt on house architecture because my friend's remark was in that connection, the same conditions prevail even where practical

considerations of plan and the perfection of new structural devices have entered in a way, it would seem, to make freedom the more easily attainable, but seldom in design, have we ceased to fight the impulse to enjoy it. Our commercial structures have been forced into shapes and masses strange to historic architecture, while what we have done, in by far too many cases, has been to disconnect and dissociate the parts that give to the older entities their aesthetic expression, and, spreading them over structural surfaces, to exclaim upon their elasticity. Elasticity is a quality pertaining to the homogeneity of an original whole, and does not fitly describe a condition of mechanical detachment of its separate parts, such as the distribution, in isolated lines and patches over a structure's integument, of features culled from historic methods.

And this tendency to hang, desperately or with self-complacence, to the old ideas, when the evolvement of new ideas would be vastly more interesting, if not so aggressively authentic, is found in other types of buildings, despite the fact, as stated by a well-known psychologist, that "civilization is impossible without traditions, and progress is impossible without the destruction of those traditions." Not so very long ago I was reading about a new and important church edifice, designed by a prominent architect. The author of the article substantiated the validity of the assertion just quoted, for by way of introduction, he said: "It seems apparent that the time has come when a living and constantly developing church cannot content itself in its visible expression with the unmodified types of design created in the past under vastly different conditions to express somewhat different conceptions."

But the designer of the building apparently had reached no such point of view, since in the following descriptions, which are abbreviated, I came upon these evidences of reactionary purpose:

"It was endeavored to plan the various departments * * * everywhere adhering as closely as possible to the arrangement hallowed by centuries of venerable use. * * * Only where the outlines of the property or the sharp slope of grade necessitated deviation from established tradition has any departure been ventured." And again, "Its plan, with the exception of the single variation from type already mentioned * * * is precisely similar to most English examples of medieval cathedrals." Lastly, in speaking of a deviation in design, as apart from the plan, the author seems to excuse it on the ground that it is "so small and insignificant, it is hardly to be noticed."

Thus, insidiously, are we led to value a building, not because it is an exemplification of the great, essential qualities of all architecture, but because it is a slavish, though clever, copy of the work of a distant generation of another people.

Since writing this paper I happened upon an article in Harper's Magazine, entitled "Is America on the Map?" in which American imitative tendencies are remarked upon, and I want to quote a portion of it which pertains to our architecture:

"Not long ago I was conducting a traveled German friend about a famous American university. It struck me before I had gone far that I had precious little to show him that could interest him. 'That tower you recognize, of course,' said I. 'It is an exact duplication of the tower at Magdalen at Oxford. This hall is an exact reproduction of the hall of Christchurch; we have even reproduced the armorial bearings of the scions of nobility that have been Christchurch undergrads. That row of buildings, as you will see, repeats the architecture of Merton. In fact, I think we have everything of Oxford here except the nose of Brasenose. There goes a procession of students. See how natural they look in mortarboards and gowns? Yes, we think we have done pretty well here; you might think you were in Oxford itself.'

"'Well,' said he, 'Oxford is Oxford and this America. Now show me something American.'

"'There's a football game,' said I.

"'Rugby,' said he. 'Your national emblem is, I believe, an eagle. You will not think me discourteous, will you? I've looked so long for something American. It has at times seemed to me that a more strictly correct emblem would be a parrot.'"

Yet twenty-five years ago Leopold Eidlitz was crying in the wilderness:

"Architecture is the art which teaches the development of structural forms. If, instead of developing forms, we borrow forms, we are not pursuing architecture as a creative art."

"An architectural monument must be developed out of its own motive, and not out of any other structure, or series of structures, no matter how good they may be, or how old."

"The mechanic art of building never stood higher than it does in its present perfection of theory and practice—but whenever the architect resorts to modern engineering, he abandons his art as inapplicable, when he attempts the pursuit of architecture as a fine art, he evades scrupulously all modern construction."

"Architecture has either ceased to speak of living ideas, or modern architects do not comprehend the ideas of the times."

Thus at the bar of the pragmatist are we condemned. If we undertake a defense, it shall not profit us to overlook the fact that the whole world is, today, in a state of flux; that in every direction great changes are rapidly succeeding each other; mechanics, chemistry, medicine, astronomy, government, religion, economics, literature, painting, sculpture, music—each is keeping pace with the progress of modern thought. In architecture there is a legitimate question whether we are really cognizant as yet of what is going on about us. We spend our time and effort in devising new adaptions and ingenious rearrangements of old forms, and consider that the results obtained have to do with a living architecture, much as the old-time theologians discussed the enlivening theme of how many angels could stand upon the point of a pin, and conceived an answer to have something to do with a living religion.

If we are satisfied to be thus engaged, it is not to be wondered at that we are lonely, that the world is leaving us behind with our fossils, while it strides on toward better, greater, more potent things. We would not deny that the old work is beautiful—too beautiful, perhaps, for us today. It may be that our day, its conditions and ideals, does not yield or demand the beautiful, as the old things were beautiful, but certainly it does demand, as it has every right to do, that its notions and ideas, its present hopes and desires, whatever they may be, shall be given such shape as shall express its real life.

If, as architects, we persist in ignoring its craving for self-expression we need not complain if our generation looks for its prophets to those whom we may esteem less qualified to interpret its needs and aspirations, but who are willing, with such ability as they may have, to respond to its newer impulses. We may continue to practice architecture in terms of the past, to hold ourselves aloof from, or to battle against, present-day tendencies and trends of thought, but never thus shall we build an architecture alive with the life of today. As Theodore Roosevelt has said but recently:

"A great art must be living, must spring from the soul of the people; if it represents merely a copying, an imitation, and if it is confined to a small caste, it cannot be great."

It is admitted that a frank acceptance of the ideas that pervade our communities, and an honest, sympathetic effort to solve their problems from their own point of view may result in what seems to us strange at

first, but we may gain comfort and poise by reflecting upon the words of a noted artist:

"What is new must always be strange, and what is strange, must, except to a few adventurous souls, prove disturbing, and hence disagreeable—but nothing fresh or good has ever come into existence without a convulsion of the old dried-up forms."

For myself, I welcome the signs of an adventurous independence in various quarters; independence, not of those fundamental and eternal principles of design, which concern proportion of spaces, direction of line, assembling and co-ordination of parts, and the disposition of masses, but of the restrictions with which the fetish of "styles" has so generally hedged about the practice of architecture. Their example will tend to drive us from our ancient anchorage and yield us a freedom that lies beyond the limits of the circumscribed and orthodox practice of architecture, a freedom which we may enjoy without explanation or apology; in which we shall be called upon to serve all the people, not merely those who, perhaps by our own blind acts and pedantic preachments, have come with us to look upon architecture as a complete, a finished thing.

* * *

Concrete Columns with Iron Core

Three or four years ago Dr. F. von Emperger, of Vienna, Austria, proposed making reinforced concrete columns with a core of cast iron; the core, as proposed, was so large that the column would in effect be a cast-iron column strengthened by a shell of hooped concrete to toughen it. He did not limit the idea to columns, but extended it also to compression members such as the ribs of arch bridges.

During the past two years this idea has been carried into practice in at least two important cases. An arch bridge of 138-foot span, the Schwarzenberg bridge, was built during the last winter in Leipzig, Germany, as a footbridge over the railway tracks near the International Architectural Exhibition; it was completed in April, 1913, and has been in use since then.

Experiments made on members built according to the combination cast-iron-and-concrete system have shown very remarkable toughness and high strength. They show in the testing machine a complete absence of the brittleness which characterizes the ordinary crushing failure of cast-iron columns. The failure loads of such columns, after deducting the load-carrying capacity of the hooped concrete shell, were over twice as high as the capacities of the unreinforced cast-iron columns.—Engineering News.

* * *

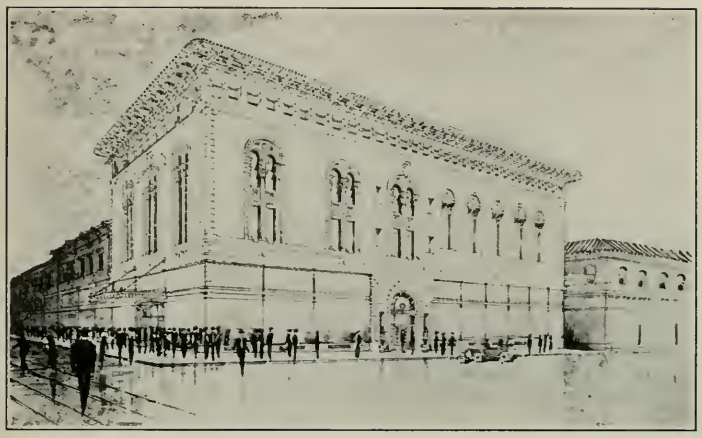
The Room Overlooked

"And how does this house suit you?" anxiously inquired the agent after he had done showing it to the prospective tenant.

"It would be all right," the gentleman answered, "if it had only five rooms instead of six."

"Why, what do you mean?" inquired the puzzled agent. "This cottage has but five rooms—parlor, dining room, kitchen and two bedrooms!"

"I know," the gentleman replied, "but you have overlooked the big room for improvements."



Native Sons' Building, Sacramento *Washington J. Miller, Architect*
Exterior to be of Socromento Sandstone Brick

Concrete Garage for Mr. A. Schilling on Shore of Lake Merritt, Oakland
Bluxome & Company, Builders

Southern Pacific Passenger Station, Los Angeles
Parkinson & Bergstrom, Architects

Los Angeles' New Depot

THE $600,000 depot projected by the Southern Pacific Railroad for Los Angeles is now approaching the stage of construction. After numerous delays and investigations the Railroad Commission of California has handed down a decision approving plans and specifications proposed by the company. The question of entrance by elevated or depressed tracks is the only one that remains to be settled.

The new station, which will be one of the finest in California, will occupy part of the present Arcade station site. The structure will be three stories in height. The station proper will cover 110 by 600 feet, while the yards will occupy fifteen acres. An automobile drive has been provided.

All trains will come into six umbrella sheds, each 500 feet long. The approach to these tracks will be through subways. Every modern convenience in station construction has been utilized and work will commence at once. Parkinson & Bergstrom of Los Angeles are the architects.

* * *

New York's First Skyscraper to be Razed

Commenting on the fact that the Tower Building, located on lower Broadway, the first so-called skyscraper to be erected in New York City, is soon to be razed to make way for a more modern structure, a writer in a recent issue of the Times states: "There is something pathetic as well as distinctly American in the fact that this building, though now only twenty-four years old and illustrating a method of construction that still passes as new, should have been condemned to destruction on the ground that owing to its antiquity all its tenants have left it." It is noted that while the structure was but 120 feet high, it was the first to receive the name of "skyscraper" in New York City.

The Bungled Bungalow

By WILLIAM SCHULTZ, Architect, New Orleans, La.

"The name bungalow," says an authority on the subject, "is a curious example of how we Americans overwork a word that is euphonious, and the meaning of which, on account of its comparatively recent assimilation into the language, is somewhat uncertain."

In this remark there is, to quote again, "more truth than poetry," at once apparent from the reading of Mr. Schultz' interesting contribution, based largely upon the writer's actual experience in the East.—Editor.

THE results attained in the design of many of the so-called bungalows going up in the East, South and Middle West are a startling exemplification of the above statement. They are, for the most part, little worthy of the name. For the many absurdities they exhibit, misunderstanding of style on the part of the designer and unintelligent interference of the owner are mainly responsible.

The attributes themselves with which the "bungalows" are accredited in current trade journals and newspaper articles are alone sufficient to show just how thorough an understanding of the nature and characteristics of the bungalow exists in the minds of many. We find such expressions as "single raised bungalow" and "double two-story bungalow."

In the first place, it is a physical impossibility to make the orthodox "raised cottage," indigenous to certain localities, assume the lines and proportions so essential to the true bungalow, for its unnaturally stilted mass precludes all possibility of designing it with the low, squatty effect that buildings of this description demand. As for two-story buildings, not even in the land where the bungalow had its origin are they so called. Double-story houses with bungalow suggestion are properly called "chalets," as being in appearance more closely allied with the chalet of Switzerland and the ancient log chalet of Norway.

* * * * * * * * * * * * *

Mr. Prospective Home Builder pays "his" architect a visit.

"I want," says he, "to build a bungalow like the ones I saw in Los Angeles last year."

Our disciple of Palladio and Vignola, those celebrated reanimators of defunct architecture, produces his sketch pad and photo books of the real California species of the bungalow.

This is a Typical California Bungalow

This is a Bungled Bungalow—Nothing More or Less Than a Two-Story House

House after house is looked over, considered, picked to pieces, discussed and passed up.

"Now, I like this one," exclaims the prospect at last. One of the pictures has caught his approving eye. It is a plain but comfortable looking one-story affair. "What can a home like that one be built for?"

After figuring hurriedly on his sketch pad the designer finally announces, "Twenty-seven hundred dollars."

"Um-m-m! So much?" rejoins the other in alarm. "I like the house a whole lot, but I can't afford to spend that much. I didn't want to spend more than eighteen hundred. Can't we cut it down some so as to get it nearer to my figure?"

"Well, by diminishing the room sizes a foot or so each way and leaving out some of the more expensive features we could perhaps——"

"That price seems pretty steep," interrupts the owner, "in face of the fact that my friend Jones built a bungalow almost exactly like this one out on Styxville Drive last summer, and he figures after paying all bills that it came to only two hundred and fifty dollars a room. I can get some reductions on materials and other things, and I'm quite sure I can do just as well as Jones did. We'll take a chance on it, anyhow. You can go ahead and draw me up a set of plans on this basis."

That settled, there arises a discussion of various considerations in order that a preliminary sketch may be drawn up.

"I want a tile floor and instantaneous heater in the bath room, and my wife just has her heart set on hardwood floors in the parlor and living room. The front porch is to have turned fluted columns like those on Smither's house (you know the place I mean, out on Hybrow avenue), and about a one-foot projection to the roof (Bonehead, the builder, told me that was plenty), with rafter ends exposed, and blinds to all windows except those in the parlor, because in the parlor we are going to have Queen Anne windows. I want asbestos shingles on the roof. (A far from satisfactory roof, but you cannot tell the owner so, for he has read all about them in the Woman's Home Companion.) Specify them in that beautiful diagonal pattern. By the way, don't forget that my dining room is to have an octagon." All of the above is faithfully and unerringly recorded on the little sketch pad.

"What height of ceiling has this house?" queries the client after musing a moment.

"Nine feet," is the reply.

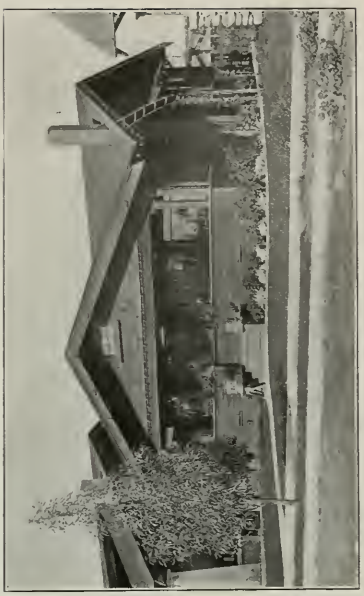
"Not on your life! None of these low ceilings for mine. Why, I would hit my head on that ceiling. No, no; I want plenty of ventilation, and besides my bed has a canopy ten and a half feet high. I was just measuring it the other night."

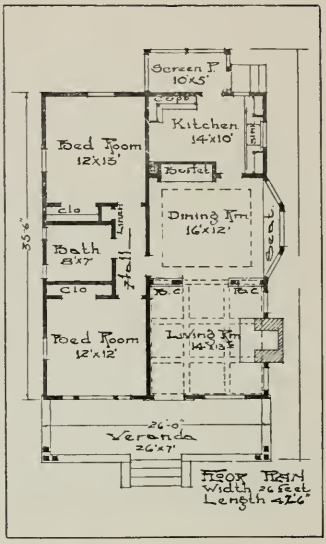
This and various other matters being settled, the owner takes his departure, requesting a sketch for the next day noon.

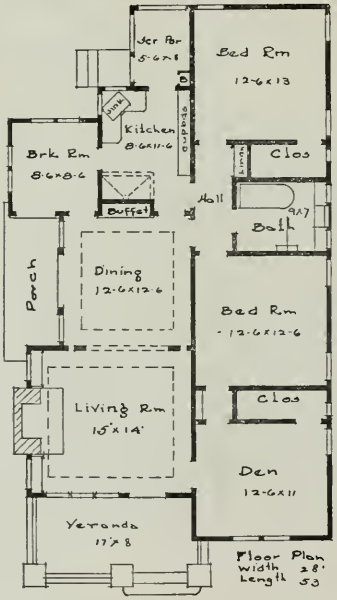
The planster of bungalows returns to his drafting board with a batch of papers bearing sketches, figures, notes and a number of other hieroglyphics absent-mindedly recorded during the progress of the long-drawn-out conference.

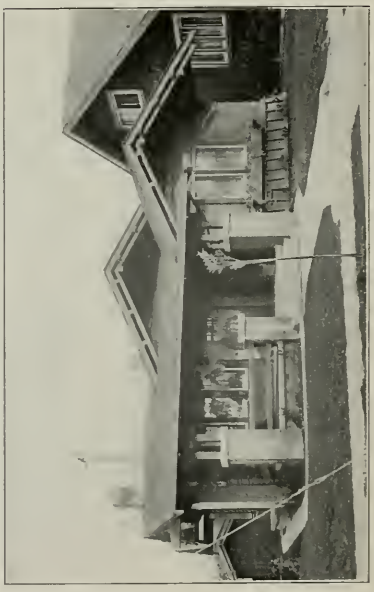
The afternoon is consumed in getting up the preliminaries. The result is an eighth-inch scale floor plan and elevation, doped up with artful skill, water-colored in the seven hues of the spectrum and a few others.

Mr. Prospect puts in his appearance the next day at the appointed hour. After uttering a number of exclamations of pleasant surprise on









Here Are Two Moderate-Price Bungalows, Both are Typical of California

Good Design for a Plaster Bungalow, San Jose
William Binder, Architect

The So-Called Story-and-a-Half Bungalow
William Binder, Architect

seeing the result of the designer's labor, he departs, taking the sketch with him for wifey's consideration. Then follow more changes, suggestions and decisions. Carefully studied features that took perhaps several hours to devise are eliminated with a single stroke of the pencil. They want sliding doors between the parlor and the dining room. If there is not space enough for the sliding doors, make the rooms wider. Cut out the clothes closets; they want to keep their wardrobes. Never mind the towel cabinet in the bath room; build a couple of shelves instead. Leave out some of those windows; they take up too much of the furniture space.

A few days elapse. The couple revisit the architect. More discussion and the contract for plans is drawn up. And in a few days more another

"bungalow" plan is turned out for estimates; and one that its Californian sisters would have an extremely difficult time in recognizing as one of their kin.

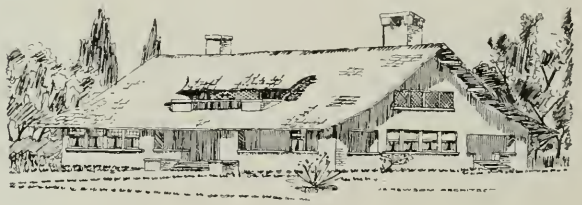
* * * * * * * * * * * * *

And so it goes. From all indications, the popular mental picture of a bungalow seems to be a frame edifice of any form, shape or size, the roof of any material and with a pitch as steep as you please, lofty ceilings, a few abbreviated brackets to give feigned support to the meager roof projections, a porch of any dimensions, large or small, with hackneyed colonnades of Ionic columns carved in cypress by some local sash-factory artist, and presto! your bungalow is complete.

The real effect to be sought is far otherwise. In bungalow design it is of prime importance to learn that its character is denominated not by the detail of its component parts, but by the mass or outline of the whole. It must be low and squatty; the roofing material must be such as will admit of a low roof pitch. The decorative effect of a bungalow's rooms is secured by delightful contrasts of plaster and woodwork and low ceilings. These low ceilings, which residents of many cities accept very reluctantly, are the very things they need to assure a warm room in winter and a cool room in summer. The idea that high ceilings offer better climatic advantages is a popular fallacy. The space above the windows forms a pocket for warm air in the summer and presents additional cubic contents to be artificially heated during the winter time. In the bungalow none of these inconveniences is experienced.

The simpler the roof lines of a bungalow, the better. Although many real bungalows may appear at a superficial glance to be complicated in this respect, they will, when observed more closely, be seen to be quite logical and thoroughly utilitarian.

As for the ornamentation of the bungalow, there is none. The architectural ornamentation of other styles is taken from ancient examples and is used mainly to break up plain wall surfaces to avoid monotonous appearance, and to emphasize entrances and other features of a building. On the bungalow this function is performed, where necessary, by the projection of plain beams, rafter ends and other structural members, and by the protecting shadow of the wide overhanging eaves, with charming effect and a success that is indisputable.



Anent the Portland Postoffice Competition

THE controversy between the Treasury Department and several firms of architects, two in New York, one in San Francisco, and three in Portland, over the terms under which they were to compete for the honor of furnishing plans for the new million-dollar postoffice in Portland has been the cause of considerable feeling among the architects of the country. As the case has never been fullly presented, it may be of sufficient interest to review it in the light of the official correspondence on the subject.

The Secretary of the Treasury selected seven architects, or firms of architects, to enter upon the competition under regulations he formulated. Six of the prospective competitors asked that the regulations be modified, whereupon they were notified by Assistant Secretary Sherman Allen, by direction of the Secretary, as follows:

"Your entrance into the competition was by invitation. The Department holds that your acceptance of the invitation carried with it the acceptance of the conditions set forth in the programme, a copy of which accompanied the invitation. It feels, however, that your attitude toward the programme of the competition and the objections which you now see in it place you wholly out of sympathy with the result which the Government desires to obtain. For this reason, and in view of the objections which you raise, the invitation issued to you July 21st is now withdrawn."

This letter brought immediate response and protest. Whitehouse & Foulhoux of Portland wrote to Senator Chamberlain:

> We cannot help but feel that the Secretary of the Treasury has acted very arbitrarily in connection with this matter. It is no more than right for a citizen to be granted an interview when he has some business dealing with any of the Departments of the Government. If there are some good reasons for not granting an interview, or for denying a request sent by letter, these reasons should be stated so one could feel that one had been treated fairly by whosoever the official may be. We feel that our requests were perfectly legitimate and we fail to understand the meaning of the letter of the Secretary of the Treasury, when it states that our objections place us wholly out of sympathy with the result which the Government desires to obtain. Inasmuch as this sentence makes the only apparent reason for the withdrawal of the invitation we feel that we should have some explanation as to its meaning. We had, at the time of the withdrawal of the invitation, spent considerable of our personal time and money in connection with the carrying out of the drawings and we are sure you will agree with us in admitting that we are the victims of a gross injustice.
>
> The main object of our request was to have the drawings selected by a jury of award. This has been the former policy of the Treasury Department, in connection with many public buildings. Our firm was invited to compete for the sub-Treasury Building in San Francisco and in the programme for this competition it was stated that a jury of three architects would decide upon the best of the drawings submitted. The question of compensation was also a matter involved and we feel that inasmuch as it has been customary for the Government in the past to allow six per cent commission, we think this same should be allowed in connection with this building. According to the programme, quite a large portion of the inside equipment would be taken care of by the Supervising Architect's Department. This would naturally reduce the proportion of the cost of the building on which we would be entitled to a commission.

Ellis F. Lawrence and Wm. G. Holford, of Portland, also wrote to ask the intercession of Senator Chamberlain. They explained that the request for certain changes in the programme of competition was signed "by six of the seven competitors invited and a personal interview by our New York representatives was sought. This was not granted and ap-

parently the Secretary of the Treasury has gone on record as being opposed to any changes in the programme of competition. Apart from the fact that we have in the meantime been spending our time and money, believing that our requests were reasonable and would receive consideration by the Secretary of the Treasury, we feel that owing to the Secretary of the Treasury's stand it will be necessary, for the protection of the Portland public, to bring all pressure to bear possible to secure the modification in the terms of the programme, as none of the leading architects of the country will participate in the competition under the present terms of the programme, now that the Secretary of the Treasury's attitude has been declared.

"We see no reason why the architect for the Portland building should not be selected under the same rules as followed by the Government in past competitions, which call especially for a Jury of Award made up of professional experts to assist the Secretary of the Treasury in his decision. Such a Jury would not only protect the interests of the competitors, but also the good name of the Secretary of the Treasury.

"We also feel that it has been proven by the House Investigation Committee during its examination of James Knox Taylor, then Supervising Architect of the United States, that it cost the United States Government well over six per cent of the cost of the buildings to procure the architect's services, and as the United States Government has in the past been paying six per cent to private practitioners wherever they have entrusted their work to them, that the Portland Postoffice should not be an exception to the rule. It goes without saying that if it is to be an exception to the rule, the best talent in the profession, which we desire to be brought to bear on the problem, will be eliminated and practitioners of a lower standard of ethics and professional ability will have to be used."

So much for the professional protests and objections. In replying to Senator Chamberlain's intervention in behalf of the Portland architects, Secretary McAdoo went into the matter rather fully and, it would seem from an official standpoint, conclusively. He said: (Sept. 30)

"My dear Senator: I beg to acknowledge the receipt of your letter of the 9th instant, inclosing letters addressed to you by Messrs. Lawrence & Holford, Whitehouse & Foulhoux, and Doyle & Patterson, of Portland, Oregon, protesting against the withdrawal of the invitation tendered to them by me to enter the architectural competition for the new Postoffice building at Portland.

"I do not feel that my action in withdrawing the invitations requires justification, but knowing your very great interest in this matter, as a Senator from Oregon, I am glad to give you the facts.

"The original list of competitors was as follows: Lawrence & Holford, Whitehouse & Foulhoux, Doyle & Patterson, Portland, Ore.; Bliss & Faville, San Francisco, Cal.; John Russell Pope, Clinton & Russell, J. H. Freedlander, New York, N. Y.

"With the exception of Bliss & Faville, John Russell Pope and Clinton & Russell, all these gentlemen actively importuned the Treasury Department for invitations to compete.

"The list of competitors was made up with great care. The three competitors from Portland were selected after a careful study of such evidences of skill as were submitted by some fifteen aspirants from that city. Messrs. Bliss & Faville were selected without their knowledge, upon the recommendation of the Supervising Architect, because of their recognized capacity. Mr. Freedlander was recommended by the Supervising Architect, partly because of his skill, and partly because he was already architect of the Portland Auditorium. Messrs. Pope and Clinton & Russell were my personal choice.

"The invitations to compete were simultaneously forwarded each prospective competitor;

"Each invitation to compete was accompanied by a copy (under separate cover), of the programme governing the competition, as approved by me;

"The letter of invitation stated that the competition was to be held in accordance with the conditions of the programme;

"Each of the invited competitors transmitted to the Treasury Department an unqualified written acceptance of the invitation;

"After a time there was forwarded to me a typewritten protest against certain phases of the competition;

"This protest was signed in typewriting with the names of all the competitors, except Messrs. Clinton & Russell;

"The protest was against certain phases of the programme which the protesting competitors had already accepted; the Secretary can no more give attention to communications not signed in autograph than to anonymous communications;

"In this case, however, the two New York protesting competitors were given an opportunity of authenticating the protest signed in typewriting; this they did over their signatures, stating that they were acting for themselves and the four competitors from the Pacific Coast;

"The protest contained certain criticisms of the programme, asking that the paragraphs criticised be modified, and wound up with a request for an interview. This was submitted by the protestants to Messrs. Clinton & Russell, with a request that they join. They replied that, while there might be conditions of the programme which they would not object to having changed, they had nevertheless accepted the invitation and thus entered into an agreement to compete. They considered that the agreement was binding and declined to make the protest unanimous.

"Messrs. Clinton & Russell took the correct view of this matter. The Treasury Department had no intention of failing to carry out its part of the agreement, and since the protestants' objections went to fundamentals of the new regulations and conditions adopted by the Department for such competitions, it seemed useless to discuss the question with them, and I therefore, withdrew, in the interest of the Government, the invitations.

"The withdrawal of the invitations was made only after careful consideration; the Secretary assumes full responsibility for it, and it is necessarily final.

"Mr. Lawrence, in his letter to you of the 30th ultimo, states that the cost of the work in the Supervising Architect's office is well over six per cent, against the six per cent fee paid for private architects. I inclose a copy of a hearing before the House Committee on Expenditures on Public Buildings, at which the present Supervising Architect was the witness. You will find, commencing on page 43, a discussion of the relation of the private architect to the Treasury Department.

"This shows that the total cost to the Government for the employment of the Supervising Architect is seven per cent of the cost of the work, and for the private architect ten per cent, on the six per cent fee, or nine per cent on the five per cent fee.

"Several of the gentlemen who address you state that they had expended considerable time and money on the problem up to the time the protest was submitted to me. If while protesting they continued to work, awaiting the outcome of their protest, that is their own risk, and the Department is not at fault.

"Messrs. Doyle & Patterson state that the New York competitors who were dropped out, and Messrs. Bliss & Faville, are at the head of their profession. They express a fear as to what will now be the outcome. The fact that even the original competitors approve the choice of the Treasury Department should carry with it an assurance that the Department will bear in mind the claims of the city of Portland to a satisfactory building.

"The conditions of the programme, to which the six competitors objected, and which probably would have been explained to them had they sought an interview, instead of submitting a formal paper requiring formal action, were the following:

"1. The absence of a jury.

"The legislation requires the Secretary of the Treasury to select an architect in competition. No authority is given to delegate this power to another. Had a jury been employed the jury could merely have advised the Secretary of the Treasury; he could not have been bound by their choice.

"Until the repeal of the Tarsney Act there existed legislative authority for the employment of judges in competitions. With the repeal of the Tarsney Act that discretion was taken away from the Secretary of the Treasury. The legislation for the Portland building does not reconstitute it, and the Secretary of the Treasury is restrained by law from accepting gratuitous services. The Secretary of the Treasury, however, has an expert adviser provided by law in the Supervising Architect. The Secretary looks to the Supervising Architect for advice on all architectural matters referred to the Treasury Department. The Office of the Supervising Architect was created for that specific purpose. There is no more reason for

the Secretary of the Treasury to deprive himself of the advice of the Supervising Architect in this matter than in all the other matters connected with the office of the latter—now entrusted with the direction of annual expenditures amounting to over $20,000,000. The law, however, requires that the Secretary of the Treasury, and not the Supervising Architect, should secure the plans for this building and, therefore, the programme was necessarily drawn in accordance with the law.

"2. The fee of five per cent instead of six per cent.

"Under the Tarsney Act the private architect duplicated a considerable part of the service rendered by the Supervising Architect. The Supervising Architect must render this service, in any event. The Portland programme was carefully drawn so as to relieve the private architect, as much as possible, of the work which the Supervising Architect must do in any event, and which the private architect would do for his private client. As the Secretary is responsible for the expenditure of this appropriation, he exercised his right to protect this expenditure and reduced the six per cent fee to five per cent, believing that to be ample compensation for the work which the private architect will perform.

"Incidentally I may say that Mr. Sayre, secretary to Senator Lane, of Oregon, who claims that he knows, is authority for the statement that at the present time on the Pacific Coast the usual fee to architects is not more than five per cent.

"3. Under the Tarsney Act the architects were compelled to pay their own traveling expenses, whether their fee was five per cent or six per cent. It would manifestly be impossible, from an administrative standpoint, to allow the architect to visit the building, at the public expense, any time he chose to do so. On the other hand, it would be equally impossible to agree to a stated number of visits, the expense to be paid by the Government, because in that event the Government would be in the position of stipulating the amount of supervision the architect should give the work; whereas, the contract with the Government requires him to furnish all the necessary supervision. For these reasons the architect, under the Tarsney Act, was required to defray his own traveling expenses, and the programme for the Portland competition, therefore, follows a thoroughly established precedent, accepted by all the architects employed under the terms of the Tarsney Act.

"4. The right to declare the competition void.

"In a certain sense these architects are bidders. No advertisement for any public work is without the clause reserving the right to reject any or all bids. The Secretary of the Treasury is not justified in agreeing to select any one of several sets of drawings, no one of which he has seen. It is conceivable that all the sets of drawings may fall below the standard desired, and the right to reject them is, therefore, one that is entirely in the public interest.

"5. Removal of the architect.

"A contract will be made with the successful architect, but he will not be bonded to the Government. Without the right to remove him, the Department would be absolutely at his mercy if he neglected his work. It is, therefore, distinctly in the public interest, and it is one of the administrative responsibilities with which the Secretary is charged, viz.: the duty to remove the architect, for cause.

"6. Modifications of the programme.

"In the usual programme, as approved by the American Institute of Architects, modifications are provided for, if agreed to by a majority of the competitors. After plans and specifications are sent out for bids, an architect will modify any one of them, or the former proposal, and will not ask the consent of a majority of the bidders. In this case, should the Secretary of the Treasury agree to modify the terms of the programme only upon the consent of a majority of the competitors, he would be sharing with them a prerogative regarding the administration of the competition given him alone by the legislation.

"The protesting competitors for this building, however, protested against this clause, stating that after the programme was issued it should not be modified, and in the same breath asked for a number of changes.

"It would seem that the protesting architects are merely the victims of their own lack of judgment. You need have no fear that architects of recognized ability and capacity will not be obtained to compete for the Portland Postoffice. Invitations have already been sent to the following architects, who are men of recognized standing and ability in their professions:

"Clinton & Russell, New York, N. Y.; Griffin & Wyncoop, New York, N. Y.; James Gamble Rogers, New York, N. Y.; Stem & Fellheimer, New York, N. Y.; Lewis P. Hobart, San Francisco, Cal.; Goodrich & Goodrich, Portland, Ore.

"I return the inclosed letters and papers, as requested.

"Believe me, my dear Senator, with warm regards, sincerely yours,

(Signed) W. G. M'ADOO."

Reminiscences of a Brick Man

By CHARLES H. FROST

TO THE EDITOR: I notice you quote me in the November number of your excellent journal as the president of the Los Angeles Pressed Brick Company. This position has been filled by my son, Mr. Howard Frost, since our annual meeting last January.

I had been trying to get out of active business for ten years and the Board of Directors finally let me off by making me Chairman of the Board and relieving me of all executive cares and responsibilities; a good thing all around.

You did not quite get the point in my rambling talk on Women's Dress and Architecture.

I did not mean that architecture was influenced by the styles worn by women—merely that there seemed to be a coincidence.

Back in the eighties profuse ornamentation was used in buildings. Because it was overdone, the construction of buildings later changed to plain molded brick and at the same time, the tailor-made girl made her appearance. Now you observe polychrome work in women's apparel—also in building fronts.

In the last paragraph of your article, you refer to diaphanous skirts.

If you will compare the office buildings constructed twenty years ago, with the present, you will notice the fronts are largely glass, some of which are so much so that they detract from the appearance of the building—neither will last.

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(The following reminiscences by Mr. Frost are interesting, as they go to show the troubles that the manufacturer used to experience in the early days of the industry:)

I started to make brick in Chicago in 1877 by a then entirely new process.

At that time there were none from Missouri; at least none of them "wanted to be shown." They knew it; each one knew just how brick should be made and each one knew better than any one else did. I did not know the first thing about making brick when I started in. If I had I would not have attempted what I did. I had no guide. I had to cut a path through a jungle, and, believe me, it cost some money and took years of hard work.

I had to put into practical shape the somewhat visionary ideas of an inventor. After I had been at it for a time, some old practical brickmakers came around to my little plant and after looking at what I was doing, told me that I never could make brick that way; that I would lose every dollar I had if I did not quit. They told me that the only way that brick could be made was to put clay in a circular pit with loam on top, saturate it with water and then temper it with a wheel, one or two horses going round and round all day until it was thoroughly mixed and in right condition to work. It was then taken out with a spade, which had to be dipped in water each time to keep the clay from sticking to it, loaded into a wheelbarrow and taken to where it was molded into the shape of brick either by hand or in a little wooden machine operated with one horse that worked the clay down into a set of six wooden molds which had to be thoroughly sanded each time before the clay was put in. The brick were carried out and laid flat on a prepared yard. When they were dry enough

they were turned up on edge. A few days later they were put into long hacks.

In case of rain, boards were placed at the bottom of each side with a saddle on top, but a heavy beating storm would wash many of the heads so that they had to go back to the pit, while the brick on the yard were sometimes a total loss.

What a wonderful difference from the present, with dry pans, pug mills, strong steel power machines and tunnel dryers, turning out thousands, where hundreds were made in the "good old times" when the "moss-covered bucket hung in the well" and all those other things that we miss(?) now!

In making pressed brick in the old-fashioned way at Philadelphia, Baltimore and Trenton, N. J., a chunk of clay was rolled in sand about as a loaf of bread was rolled in flour. This was slammed into a mold and struck off. These had to be hacked until they were in proper condition, care being taken that the wind did not strike them so as to dry one end more than the other. They were then repressed in a hand machine, one man to put them in the press, one man to work the lever, a boy to take off and place in what was known as a five-high pack, this to keep them as near straight as possible. When they were dry enough to stand up, they were placed in a pigeon hack, where the air passed between them. From this they were set in the heart of up-draft kilns. With all this labor and care they would come out warped, different lengths and widths and had to be gauged into as many as forty different piles for the pressed brick layer.

Up to thirty-five years ago there had been very little advance in brick-making from Pharaoh's time, except that the admixture of straw had been discarded. Brickmakers seemingly did not know that it was the silica and alumina in the clay that fused with the action of fire and if the clay was made homogeneous that water was of no value except to make the particles adhere in molding it in the shape required, and that by using sufficient pressure the quantity of water could be reduced to a minimum, making that much less to be eliminated in the drying and keeping the brick more perfect in shape.

After being at it for two years I wished I had taken the advice of those old brickmakers, for I had got to about where they said I would. But I was not a quitter, and have remained at it ever since. We are now making about everything that is produced in clay goods. Our output this year will amount to about $750,000, which is fairly good for a new country. While clay products generally have undergone a marked improvement in the process of manufacturing, increased facilities, greater capacity with less space than formerly required, and the old brick yard supplanted by the brick plant, there is one very large and very important part of the business that is conducted as it was fifteen or twenty years ago, and that is the making of paving brick.

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It was found that to get the best pavement, the brick should have rounded corners with raised up lugs to keep the brick apart sufficiently to allow the cement filler to form a perfect bond. The only way known at that time to accomplish this was to take the brick from a side cut machine and repress them, and this useless, expensive and unreliable method has been followed largely ever since.

The specifications called for the brick to be "repressed to the extent that the maximum amount of material is forced into them." That is just the opposite of what occurs, as the brick is larger after it is repressed than before and everyone knows that a paving brick will show very much less abrasion before it is repressed than after.

The bar is run out on the auger machine, about nine inches wide, cut to the size of the brick or block, then put through the represses, each repress requiring one man to take off of the carrying belt and feed into the machine and two men to take off and place on car.

The auger machine is generally a very strong, powerful and reliable machine and can be depended upon to run every day, but the represses are of lighter build; the plunger has to go to a fixed point with each movement. If the bar comes out stiff, as it often does, it is a great strain on the machine and they are breaking down continually. The dies wear out rapidly; a stream of oil has to be kept running on both top and bottom of brick to prevent their adhering to the dies. This film of oil covering the brick retards their drying. The represses and shafting have to be lubricated and belts break or have to be relaced.

Now, how can paving brick be made with rounded edges and raised-up lugs without the expense and uncertainty of repressing? Simplest thing in the world. In place of side cut, run the bar out end cut; the die having rounded corners and ridges on the side of the brick, these ridges to be indented by a wheel that is set against the bar and is revolved by the movement of the bar. That is all there is to it. When the auger machines run, the brick are made complete, taken off of the carrying belt and placed on cars, cutting out the two men at each repress and all the other expense.

The pressure on the end-cut bar is on all four sides of each brick and is greater than when distributed over the nine-inch bar. The bond is not broken up in this way, as it is in repressing. The brick will run more uniform; many brick that would run above twenty per cent. in the rattler and be rejected will come within the requirements and therefore increase very largely the percentage of No. 1 brick from the kilns. With this method our kilns run as high as ninety-five per cent. No. 1 pavers.

The ultimate test as to quality is the rattler. If, when put through half a dozen represses, they go above twenty per cent. abrasion, they are rejected. Why not use the shorter method which can always be relied upon, turn out a greater number of brick, cut out all this useless expense and make better and more uniform product?

* * *

Not so in San Francisco

A well-known architect said in New York the other day:

"Some of our skyscrapers in New York and Chicago are things of beauty. Others, again, are in such atrocious taste that they remind me of the Oil City farmer.

"An Oil City farmer struck oil on his farm and came straight to town and bought his wife a $750 piano.

"A week or so later he turned up again to buy a book of college songs.

"'How do you like the piano by now?' the salesman asked him.

"'By crinus,' chuckled the farmer, 'ye'd oughter see it now, young feller. My old woman's painted it yaller to match the chest of drawers.'"

Birds'-Eye View of the Spaulding Dam
Four No. 14 Smith Mixers and Two Clyde Cableways used

Heavy Concrete Dam Construction

By J. A. BRIED

IN THE construction of the Pacific Gas and Electric Company's concrete dam at Lake Spaulding several features present unusual interest not alone to engineers, but to concrete contractors and builders generally.

The dam is to impound the waters of Lake Spaulding and is part of a hydro-electric power generating system to increase the capacity of the Pacific Gas and Electric Company's already extensive electrical resources. It is being thrown across a mountain gorge in the high Sierras near Emigrant Gap, Cal., some 170 miles from San Francisco.

The elevation of the lake is about 4,800 feet above sea level and the total height of the dam is to be about 300 feet so as to ultimately increase the depth, or raise the surface of the lake to this extent, which will, of course, cause it to spread over a considerably larger area than at present, it is estimated 805 acres—with a catchment area of some 120 square miles.

Water from the lake will be conveyed through tunnels, canals and enormous pipes to the forebay and electric generating station on the Bear River, Nevada County, 10.8 miles distant. In fact the system has already been placed in partial operation, as the first water was passed through a few days ago, and though the dam is still a year from completion, it is nevertheless high enough to hold what water is expected to accumulate before work is resumed next season.

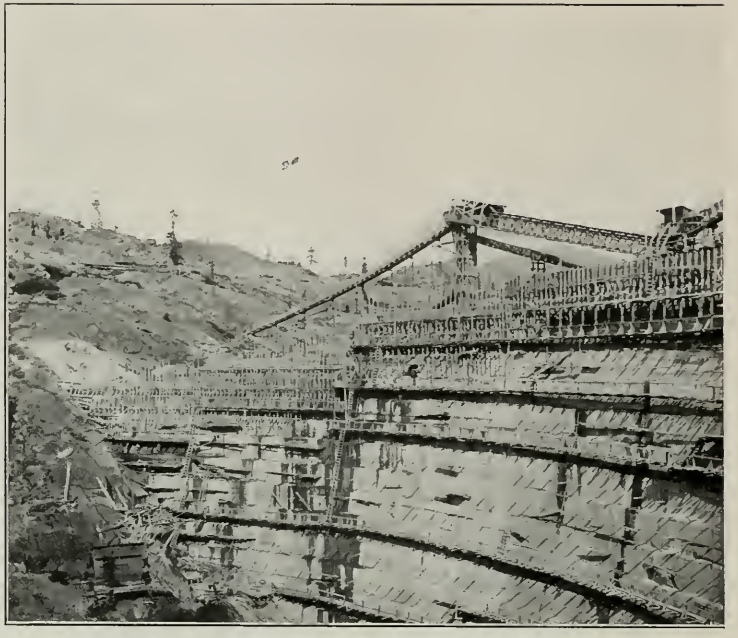
When finally completed, the dam, which is of the arched type construction, will measure: Length, 1000 feet; thickness at bottom, 186 feet; height, 305 feet (at present it is about 225 feet high).

Interesting to architects, contractors and builders is the method of handling the great quantity of concrete material before and after mixing.

The mixer house is located on the mountain-side above the damsite and the material is alternately chuted down by gravity and then elevated on rapidly moving belt conveyors, until it arrives at the forms to be filled. Using a belt conveyor for the rapid transportation of wet concrete is quite a new departure and especially so is the elevation of such material on belt conveyors, owing to the tendency of the water to separate out and run back.

However, by speeding up the belts to some 400 feet per minute, this tendency is negligible and the success of the installation can be appreciated

Belt Conveyor Discharging Wet Concrete—Speed 400 Feet Per Minute



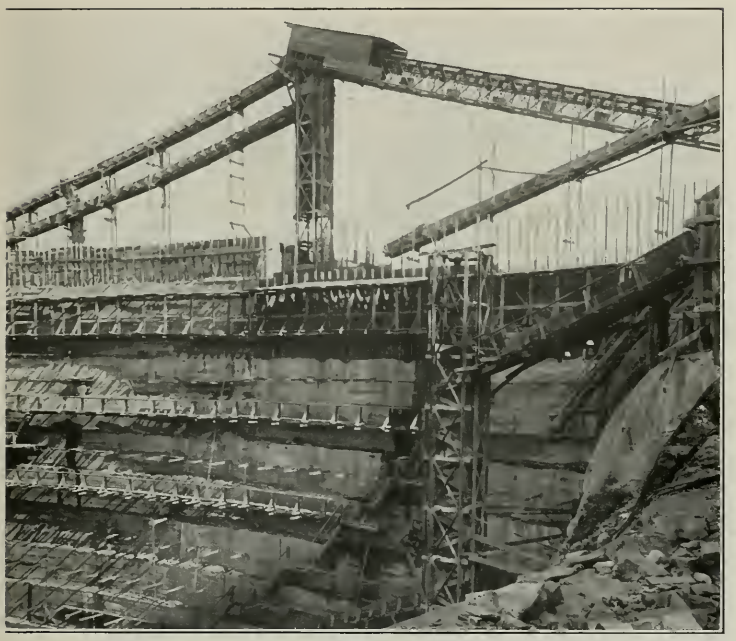
View of Upper Part of Dam, Looking Up Stream

through the fact that over 2000 cubic yards of wet concrete was thus conveyed to the forms in a working day of ten hours—a record-breaking pour in any similar undertaking, it is claimed.

When construction was first undertaken, about a year ago, the company operated their own quarries, crushers and screening plant to obtain the concrete material and also had a complete M. & G. sand and gravel washing plant erected to secure the finer constituents for the concrete, from a large deposit near the damsite. But for the last eight months has been obtaining from the vicinity of Colfax a good quality of river gravel and sand of just the right proportions suitable for concrete, and owing to the short haul (about fifteen miles) and plentiful supply, the quarry and crushing operations have been entirely discontinued.

The gravel as obtained from the river bed is carried in steel cars over the company's own spur tracks from the Southern Pacific main line, to the damsite and dumped into bins directly over three different size M. & G. belt conveyors formerly used to carry the rock, sand and cement separately, but now all used for gravel.

The belt conveyors are fed with gravel from the openings in bottom of bins by means of automatic reciprocating feeders and after being conveyed to the mixer house is discharged by trippers into bins above the concrete mixers.



Belt Conveyors Shown to Right of Towers and Gravity Chutes to the Left

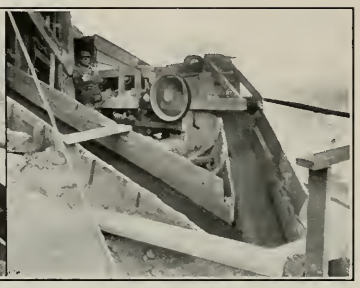
The sacks of cement are also carried from cars on belt conveyors to the mixing house where five one-yard mixers of the revolving drum type are kept in constant operation which discharge the mixed concrete directly onto a horizontal belt conveyor traveling at a speed of some 400 feet per minute.

This conveyor discharges into a gravity chute leading down the hillside to the first elevating belt conveyor, which carries it upward at an angle of 18 degrees to a tower erected on the dam, from which point it is chuted down to another belt conveyor operating at an angle of about 15 degrees and again carried upward to the final gravity chute.

The birdseye view of the dam printed with this article shows clearly the gravity chutes from the mixing house leading down to the belt conveyors and chutes erected over the dam.

A complete description of the tunnels, pipe lines and power house would make interesting reading, but space forbids—suffice to say that the power house known as Drum Power Station, which is to be operated by the water of the lake, is one of the most modern in the country, being entirely of steel and concrete construction, 77 feet wide by 208 feet long. It is equipped with two double overhung impulse water wheels operating electric generators of 33,500 H. P. capacity, though the capacity will be doubled when the dam is finally completed.

Belt Conveyor at Rest, Showing Wet Concrete on Belt



Same Conveyor in Motion, Showing Flow of Concrete in First Gravity Chute

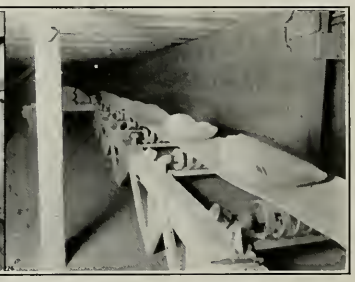
At present the current is transmitted at a 100,000 volts to the Cordelia sub-station over a hundred miles to the westward, at which point it is stepped down to 66,000 volts and transmitted to the various bay cities.

The total cost of the project will run into ten million dollars; cost of dam alone when completed will be about two million.

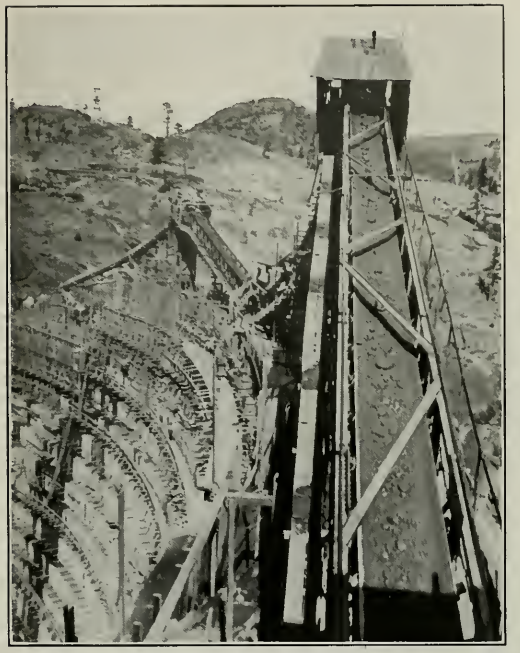
The four 12,500 kilowatt generators (two at present in use) were made by the Westinghouse Company, but much of the other machinery is of local manufacture, the water wheels being made here by the Pelton Water Wheel Company, and all of the belt conveyors, elevating and concrete material handling equipment used in constructing the dam, being manufactured in San Francisco by the Meese & Gottfried Company.

As an engineering feat the project is one of the noteworthy achievements of the times and reflects great credit upon the engineers of the Pacific Gas and Electric Company, largely responsible for its success, and chief amongst whom were Messrs. F. G. Baum, R. G. Clifford, D. H. Duncanson, L. E. Spangler, P. E. Magerstadt, A. E. Chodzko and a host of other indefatigable workers, division superintendents, etc., etc., as many as 1500 men at a time having been employed on the big undertaking.

Belt Conveyors Carrying River Gravel to the Mixers

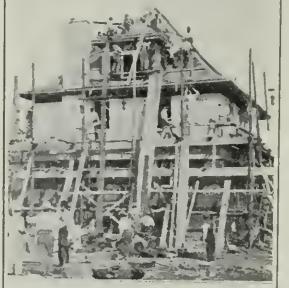


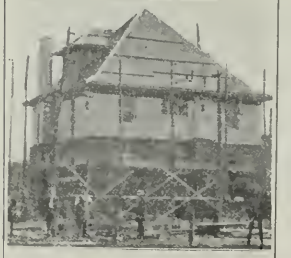
As Many as 7000 Sacks of Cement a Day Carried on Belt Conveyors



Belt Conveyor at Close Range

Concrete Bridge on the San Jose-Oakland Road Over Coyote Creek. Three 70-Foot Spans
J. G. McMillan, Engineer





Building a House in a Day

JUST as an index to what can be done in a typical Canadian town with Canadian enterprise, Hamilton, Ont., recently put up a 9-room house, valued at $6,000, in twenty-four hours.

When Alderman James Bryers first stated that he would attempt to erect a house in one day, the idea was laughed at by a great number of people. Many were under the impression that it would be a small one-story affair. Far from it. It is an imposing two and one-half story brick structure, and is as substantially built as if it had taken weeks to complete. The handsome structure has been seen by thousands and is a never failing source of surprise to all, when it is noticed that it has nine rooms and is complete in every detail.

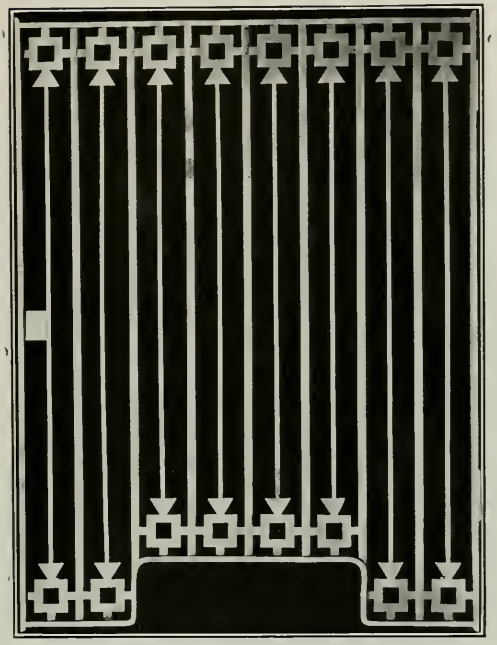
The first sod was turned at a quarter to five on Tuesday afternoon, August 12, 1913, by Mayor Allan. Five hours later the building was up to within a few feet of the second story. As the workmen were at work all night, arc lights were strung on poles around the building. There were at midnight between 300 and 400 men at work. The carpentering went on simultaneously with the bricklaying, and as cement mortar was used a concrete mixer was kept at work.

Even now that the great task has been completed those who have not seen the house cannot realize what a handsome, modern structure it is, says a writer in a recent issue of a Canadian exchange.

The building is 34 by 33 feet outside measurements and may properly be called a four-story house. It contains a basement, first and second floor and finished attic. The roof is Gothic in design, and the general architecture of the building is anything but simple. The foundations are cement with brick facings, the upper portion of the building proper being solid brick. Everything in the house from start to finish is the best to be had, all materials used being first grade.

Some idea of the rapidity of the work may be gathered when it is understood that the plasterers, using special prepared quick-drying plaster, applied their first trowel of mortar at 12 o'clock, noon, Wednesday, and at 2:30 p. m., just two and one-half hours later, every room in the building, including clothes closets, was finished with second coat, hard white enamel finish in every way, just as pretty and just as well put on as is usually the case where several days are taken for doing the same work.

Every room is furnished beautifully, not a single detail being overlooked. The furniture, carpets, curtains, draperies, even to the attic, were the last word in house furnishing, and proved a surprise to the large crowds who inspected it.



Bronze Bank Wicket, People's Bank of Santa Cruz
W. H. Weeks, Architect

The Steel and Iron Industry of California

V.—The West Coast Wire and Iron Works.

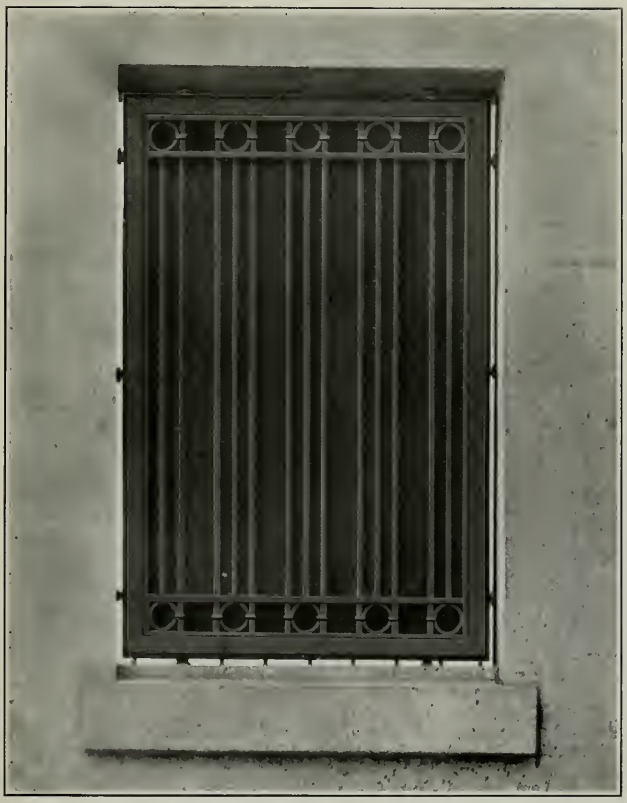
By a Staff Writer

GREAT though the progress has been in all lines of building and construction work, there is no branch of the industry that has shown more important and decided changes than the ornamental iron business. Gradually changes have taken place, old ideas have given place to new, until even in our comparatively small cities we find steel skeleton structures reaching towards the heavens while their interiors are given a big-city aspect with their ornamental and cast-iron stairways and elevator enclosures.

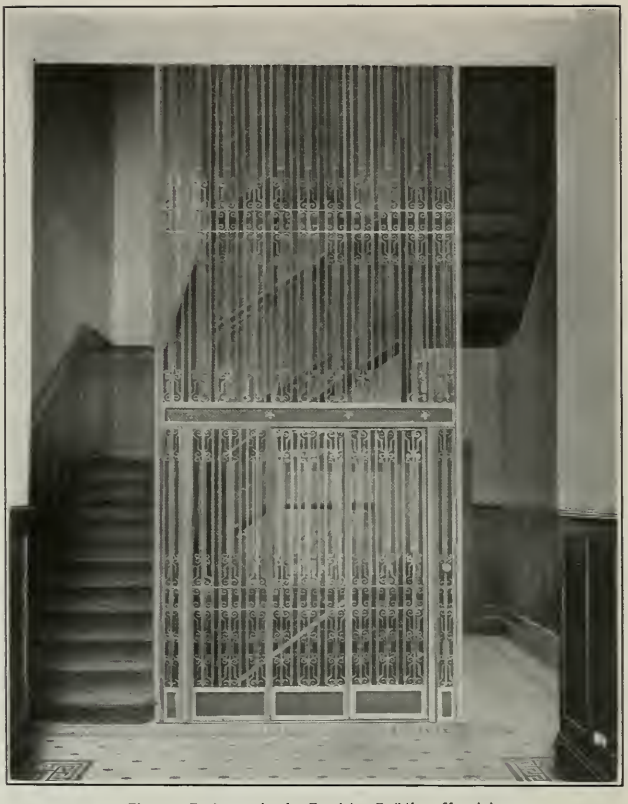
It is not more than thirty years ago that ornamental wire was used exclusively in the way of metal finish in banks, for elevator enclosures, balcony rails, jail cells, fences and similar purposes. Today the use of ornamental wire has given way to ornamental iron and bronze—a far more durable and impressive style of finish.

The improvement has been a great one and has been due to the combined efforts of the architectural profession in its quest for novelty, com-

Solid Bronze Gate to Mary E. Prior Mausoleum, Cypress Lawn Cemetery, San Mateo County
B. R. Christenson, Architect



Rear of Mary E. Prior Mausoleum, Cypress Lawn Cemetery



Elevator Enclosure in the Excelsior Building, Honolulu
Emery & Webb, Architects

bined with beauty and durability. The manufacturers of ornamental iron and bronze have made every effort to keep pace with the architectural profession, and the result has been high-class workmanship.

The history of the manufacture of ornamental wire from which has evolved the ornamental iron and bronze industry began in San Francisco in 1873, when the California Wire Works was put into operation by a group of capitalists, at the head of which was A. S. Halliday. He arranged in 1882, to bring from Engalnd two mechanics who later took a very prominent part in the development of the business—Edward Smith and James Trowbridge. In 1887 the California Wire Works discontinued business. Messrs. Smith and Trowbridge then formed a partnership under the name of the West Coast Wire & Iron Works. Under the direct

management of its founders this firm continued to take an active part in the industry until fifteen years ago, when it passed into the control of the late F. C. C. Scherling.

After the death of Mr. Scherling in 1908, the company incorporated, and under new executive heads continued the manufacture of ornamental iron and bronze and wire work as before.

The West Coast Wire & Iron Works has built up a business which covers a vast field. Their work is shipped to and erected in Hawaii, New Zealand, Canada, Eastern United States, Mexico and Alaska. The company makes a specialty of shipping in readiness for erection. The system used is one which has been evolved after years of experience and is of such a nature that the work may be put up even by unskilled labor.

A notable contract of the latter type was the grille work, elevator enclosures and iron stairways for the Y. M. C. A. building at Honolulu, for which Ripley & Reynolds of the Hawaiian capital were the architects and the Pacific Engineering Company of the same city were the contractors. This work was installed by unskilled Kanaka laborers. A similar contract was that for the Mexican government, including huge wrought-iron window grilles, stands and similar equipment for the free market at Hermosa. These window grilles were of wrought iron, 15 feet by 17 feet, and weighing 1500 pounds each. The whole shipment amounted to two full carloads and cost in the vicinity of $25,000.

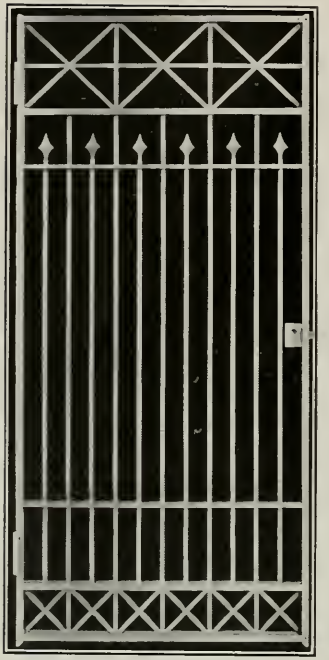
One of the samples of workmanship and architecture shown in an accompanying plate is a bronze mausoleum gate erected in Cypress Lawn cemetery, San Mateo county, for Mary E. Prior, and of which B. R. Christenson of San Francisco is the architect. This gate was designed with the intention of departing materially from the usual designs. The style of architecture is Doric and the gate was planned to be in keeping with this design. The gate is hand-chased and all the material used is of a smooth finish.

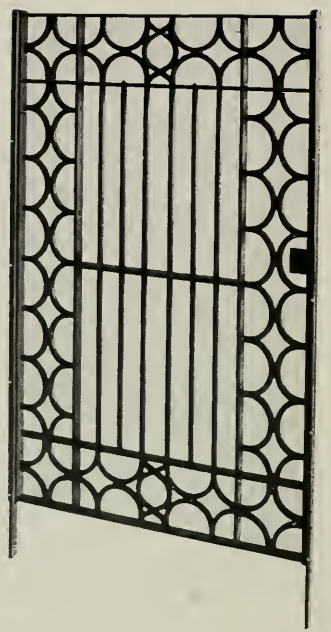
Another illustration depicts an elevator enclosure in the Excelsior Building at Honolulu, designed by Emery & Webb of that city and erected by the Von Hamm-Young Company, also of Honolulu. In this case also the iron stairways and the five elevator enclosures were erected by unskilled labor. The contractors, after the work had been finished, wrote the West Coast Wire & Iron Works that the material had been assembled without difficulty and had proven most satisfactory to both owners and architects.

Another notable contract for which the material was shipped to Honolulu was in connection with the mausoleum for the grave of no less a personage than King Kalakua, a former ruler.

Although the company ships extensively to foreign countries, its product is much in demand locally. A contract was recently taken for the balcony rails, iron stairways and wire window protectors for the Fresno convention hall; the bronze work and the pivoted metal sash for St. Ignatius church, San Francisco, of which Charles J. I. Devlin is the architect, and others of a similar nature for various buildings in the city and state. An unusual achievement was recently carried out by the company in supplying the brass and iron work for Fred Solari's grill, Geary street, Righetti & Headman, architects. One of the conditions of this contract was that the work should be fabricated and installed in one week's time.

The management of the company is now in the hands of Robert Browell, the vice-president. Mr. Browell has been actively engaged in





Bronze Grille in Douglas County Bank, Waterville, Wash.

C. G. Bodgley, Architect, Seattle, Wash.

the same line for thirty years, having served his apprenticeship with the California Wire Works. The management of the estimating department is in the hands of George S. Menke, who began as a boy of fourteen with the West Coast Wire & Iron Works, and who has been in their employ ever since—a period of sixteen years. Mr. Menke's assistant in the drafting department is E. M. Seeburt.

The company's history has been one of steady expansion and progress. At the beginning, they occupied premises with a floor space of only 1200 feet. The plant had grown to one of 6,000 feet floor space when it was destroyed by the fire in 1906, and at the present time it occupies a space of 12,000 square feet, every foot of which is utilized to such an extent that a still greater space will soon be required.

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Personal.

Albert W. Burgren, architect, formerly of the firm of T. Paterson Ross and A. W. Burgren, wishes to announce to his friends and clients that he has opened offices in the Holbrook Building, 58 Sutter street, San Francisco.

News in Architects' Offices

Contracts for part of the work of construction of an ornate residence have been awarded by Architects Henry Geilfuss & Son of San Francisco for Mrs. A. B. S. Knauer of Sacramento, who is going to make her home in San Francisco. The residence will be erected on the southerly line of Pacific Ave., 62 feet 6 inches west of Buchanan street, upon a lot with a frontage of 40 feet and a depth of 165 feet. Its exterior design is in the richly ornamented French Renaissance, which conveys an idea of the interior treatment.

Architect O. R. Thayer of San Francisco has completed working drawings for the new garage building which is to be erected on the Davidow property, on the east line of Van Ness avenue north of Jackson street. The building will be a partly one and partly two-story reinforced concrete structure, with concrete floors and interior partitions of metal lath and plaster.

Architect M. Mastropasqua has plans completed for a three-story and basement concrete store and apartment house to be erected at the southeast corner of Twenty-third and Bryant streets. The building will cover an area of 50x52 feet. M. Victoria Sattui is the owner of the property. The first floor will contain several stores, and the upper floors will be subdivided into two and three-room apartments.

Architects Rousseau and Rousseau, Monadnock Building, San Francisco, have close to $500,000 worth of work in prospect for the coming year. The firm is especially busy in Oakland and the opening of a branch office in that city is seriously contemplated. Work now on the boards or ready to be let includes a $200,000 class A hotel for Nob Hill, an apartment house on Greenwich street, San Francisco, a three-story frame and plaster apartment house for Wallace Avery Scott at Prince street and Telegraph avenue, Berkeley, a four-story brick and steel apartment building for Dr. F. G. Baird on Oak, near Fourteenth street, Oakland, and three garages in different parts of the city of Oakland.

Architect E. E. Young of San Francisco has prepared plans for a number of very attractive frame and plaster bungalows to be erected at Burlingame for the Peninsular Building Company.

Architect E. C. Hemmings of Sacramento has completed plans and let contracts for an administration and office building for the West Sacramento company, to cost $15,000; also a new edifice for the Unitarian Church Society of Sacramento.

A Forty-Story Skyscraper

WILLIAM A. NEWMAN, the San Francisco architect, states that an Eastern syndicate of capitalists has obtained plans from him for a forty-story structure to be erected on a prominent corner on Market street, San Francisco, at a cost of $1,500,000 for the building.

The building as planned will be the largest and handsomest office building on the Pacific Coast, and one of the finest of its kind in the world. The style is adapted from the French Gothic of the fourteenth century.

Costly Apartment House

The coming year will probably see construction work started in San Francisco upon a magnificent apartment house, similar in style to those along Riverside Drive, New York. It is to be in California Street, "Nob Hill," as the San Franciscans call the section in which their most beautiful residences are to be found. For the site, John W. Proctor and Selah Chamberlain have purchased two lots opposite the Pacific Union Club, for which they paid $100,000. At present the intention is to erect an eight-story, class A structure. John Galen Howard is the architect.

International Exhibition for 1915

The San Francisco Architectural Club already is preparing to "do things" in 1915. A contract has been signed for the publication of a splendid Year Book in connection with an International Architectural Exhibition which is planned to be the largest event of the kind ever held anywhere. Architects from every corner of the globe will be invited to exhibit some of their work. The following committee has been named to take charge of the details: Tobias Bearwald, Charles Peter Weeks and August G. Headman.

Hornbostel to Design Pennsylvania Building

Governor John K. Tener of Pennsylvania writes President Moore that the Pennsylvania Exposition Commission has appointed Henry Hornbostel, who designed the Oakland City Hall, the architect of the Keystone State Building at the Panama-Pacific International Exposition.

School Plans Being Prepared

Plans are being prepared for a grammar school at Sanger which will cost $25,000. The architect is J. Carl Thayer. The building will be one story and contain nine rooms. Construction will be of brick, with tile roof. A heating and ventilating plant will be installed.

View New Masonic Temple

The new Masonic Temple at Van Ness Avenue and Market Street, San Francisco, was inspected recently by more than 300 architects, engineers and draughtsmen of San Francisco and the Bay cities. The inspection was through the courtesy of the hall association and by request of architects throughout the State and in San Francisco, the majority of whom had had no opportunity to examine the structure since its completion. The architects were taken through the building in groups. For two hours they were guests of the Masonic hall directors. Many compliments were exchanged.

Bliss and Faville designed the building, which is in the Florentine style. Besides the members of the San Francisco Society of Architects, there was a good attendance from the Chapter and the Architectural Club.

Personal

Architect Samuel B. Zimmer, formerly of Oakland but for some years a resident of Imperial where he went in search of health after a breakdown due to overwork, is now located at Santa Ana with offices in the Savings and Trust Building.

Gervaise Purcell, consulting engineer, Union Oil Building, Los Angeles, has been honored by the Council of "The Institute of Civil Engineers," London, England, by the conferring on him of a Telford Premium as a mark of appreciation of his paper on "Improvements in Los Angeles Harbor."

Charles A. Smith, senior member of the architectural firm of Smith, Rea & Lovett, of Kansas City, was a recent visitor to the Pacific Coast. His firm are the architects for the board of education of Kansas City, being engaged in executing about $4,000,000 worth of school work aside from the private practice.

S. P. Depot to Go Ahead

It is announced authoritatively that bids will be taken early in the year for the new Southern Pacific Third and Townsend Streets passenger and freight depot, San Francisco. The supervisors have passed to print an ordinance granting the Southern Pacific Company a new franchise to cover changes of track and building. It is said the company has practically agreed to accept the city's terms and that orders have been given to complete the plans for a $200,000 depot.

Subway Loop Suggested by Polk

The construction of an underground loop for street-car traffic, bordered with walks for pedestrians, in front of the San Francisco Ferry building is the solution of the foot-of-Market-street congestion suggested by Willis Polk, the architect.

According to present plans, the idea under consideration by the State and city is the building of an overhead loop to carry half of the street car and pedestrian traffic during the rush hours.

"The overhead structure would disfigure the city," says Polk. "The Ferry building can be easily adapted to the underground route to the ferry boats and it will give even greater efficiency in getting ferry passengers in and out of the city. Why should we destroy the beauty of the end of Market street?"

Polk's plan is to load the upper deck of the ferries with the surface traffic by means of an easy incline and to load the lower decks with the underground traffic by a parallel slope.

Will Call a Spade a Spade

(Read before the San Francisco Chapter A. I. A.)

The Committee on Publicity begs leave to report that many of our architects in San Francisco have no work, that others have ceased to do business, and are looking for positions as draughtsmen in architects' offices; further, that many draughtsmen, with families to support, are out of work, and are applying to architects for assistance.

Your Committee, later on, when the regular business of the meeting will open, will introduce some resolutions in which it will ask the members to discuss (and if necessary, to call a spade a spade) such matters as may be deemed essential for the betterment and uplifting of the Chapter.

Noted Eastern Architect Dead

George Browne Post, noted architect, died at his home in Bernardsville, N. J., after an illness of less than twenty-four hours.

Post designed many famous buildings in New York and throughout the country, including the New York Stock, Cotton and Produce Exchanges, the College of the City of New York, Pulitzer building, Equitable building, which was burned two years ago; residences of Cornelius Vanderbilt and Collis P. Huntington, and the Manufactures and Liberal Arts building, covering forty acres, at the Chicago World's Fair. He was a member of numerous societies and had received many government appointments to memberships on fine arts commissions.

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SIDEWALK LIGHTS

The recent rains have demonstrated the poor work done in San Francisco in the construction and installation of sidewalk lights. Leaky basements and ruined stocks testify eloquently to the careless workmanship of the sidewalk contractor. It would be well, perhaps, to hold back a portion of the sidewelk contractor's payments until a good rainfall has shown whether his work is at least temporarily waterproof — although even their poor materials will not withstand the test of time. The tearing out and replacing of a number of recent installations in the business section of the city is an apt illustration of this state of affairs.

INDIRECT LIGHTING

Indirect lighting seems to be coming into favor, and, contrary to the opinion of many, it is urged on the score of cheapness as well as that of beauty and effectiveness. Concealed lights, whether placed in cove, ceiling or side wall, offer a pleasing variety in the ordinary lighting system, and architects are beginning to include them not only for auditoriums, libraries, lobbies, etc., but for all the rooms and offices in a building.

SELLING GOODS FROM PHOTOGRAPHS

This may be necessary in some instances, but in most cases the architect and the contractor will favor those manufacturers who warehouse their goods here and are able thus to promptly fill orders. Of course this cannot be done in those instances where special designs or construction are essential. We are most often judged by the confidence we have in ourselves, and the manufacturer who backs up his opinion that he has the right goods by carrying a stock here in San Francisco is pretty certain to have the first call in the matter of orders.

San Francisco Society of Architects

Regular Meetings Second Wednesday of Each Month

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The constitution and by-laws of the society are substantially those of the American Institute of Architects.

The society has voted not to increase its membership beyond the present number for an indefinite period. When the society decides to withdraw this temporary restriction, then, in accordance with the by-laws, any practicing architect or any architect engaged in architectural education or any architectural draftsman, over thirty years of age, will be admitted to membership if he can submit proofs of his honorable personal and professional standing. The applicant for membership will require the approval of all the members, to be elected.

The society meets on the second Wednesday of each month. The annual meeting takes place in June.

BUILD FOR THE FUTURE

The shrewd architect who expects to remain in the field considers permanency as a first requisite in his building. The day has gone by when cheap subterfuges and imitations will answer. There is a "come-back" on the architect which is not comfortable, when valves leak, hinges squeak, windows rattle, tilings break, ceilings crack, woodwork sags, walls crumble, elevators won't work, piping is insufficient, and a hundred other weaknesses manifest themselves. Why not stand for good, durable, efficient work and take no chances?

Speaking of leaky valves reminds us of some of the toy plumbing fixtures in one of San Francisco's largest office buildings. These fixtures, or part of them at least, are constantly giving the owner trouble, and it is not an unusual thing to find posted on the door of one or more toilets this annoying reminder: "Out of order."

PROTECT YOUR STEEL

Architects should specify a coating or enamel for their steel structures, and thus ensure a long life for the buildings. We see many steel frames going up, not thus safeguarded, which even before erection show signs of rust and deterioration. Too great care cannot be exercised in this respect, as the small additional cost is the cheapest kind of insurance, and experience has proven that steel buildings thus protected have almost an unlimited tenure of life.

The Fly Pest

The absence of screens is about as noticeable in old buildings in San Francisco as that of adequate heating systems. Modern structures, however, are including both screens and furnaces—for the warm day and the occasional cold one offer equal discomfort if there is no protection. Health authorities warn us against the pestilential fly and it is about as sensible to omit the shade or the awning as to leave out the screens.

State, County and Municipal Engineering

Good Roads—Water—Sewers —Bridges—Fire Protection

Some Notes on Paving

CLARK R. MANDIGO,*
In Harvard Engineering Journal.

AS ALL engineers are more or less interested in the difficulties encountered by their associates in other lines, it is hoped that a brief recital of some of the problems in street paving which confront the average municipal engineer may be of general interest. It is not intended in this short article to elaborate on the technical trials and tribulations, which are more or less common to all branches of the engineering profession, and which are in the nature of family quarrels, not to be paraded before the public; but to point out briefly some of the economic problems which should be carefully considered by all good citizens in providing satisfactory pavements for our city streets.

In the first place, a great deal of money has been wasted in paving wider roadways than there is any necessity for. Fortunately, present good practice is correcting this waste by paving narrow roadways on the majority of residence streets, and at the same time providing ample room for traffic on a few arteries of travel. The minimum width of roadway should not be less than 22 feet between curbs, except on unimportant side streets, and preferably not less than 26 feet. With a double street-car track, the minimum width of roadway should not be less than 42 feet, although 36 feet might do, and on busy streets not less than 54 feet.

Another source of financial loss to taxpayers is the usual haphazard method of selecting the kind of pavement for particular streets. This evil is chronic with most cities at the present time, and is due to a number of causes:—

1. The city charter may require the property owners, the City Council, or an Elective Board, to name the kind of pavement; or

*Assistant City Engineer, Kansas City, Mo.

Panoramic View of Gravel Beds, Electric Elevator, Plant and Locomotive Crane of the Niles Sand, Capacity 1500 Yards

2. Bids may be received on a number of different kinds of pavement and the choice made after bids are opened; or,

3. The proper attention and advice to the selection may not be given by the engineering department.

There are, of course, a number of contributing causes, but these are usually interwoven with more than one of those named above. If (1) obtains, a pavement is selected because of its cheapness or finished appearance rather than its suitability or durability. Property interest is often only transitory. Case (2) gives paving promoters an opportunity to "work their rabbit's foot" and a selection is usually made from other considerations than the particular needs of the street itself. The general lack of appreciation of the value of the services of a competent engineer accounts for the condition stated under (3). Changes in municipal officials are frequent and the selections in the engineering lines are not always based on qualifications as municipal engineers. As a consequence, a good railroad or structural engineer, on becoming a city engineer, is so overburdened with the ordinary routine details that he has not the time to study the underlying problems of his work.

Possessed of a thorough knowledge of the qualities and limitations of the various pavements, a municipal engineer should make recommendations as to the kind of pavement which a close study of the present and future traffic needs of each particular street indicates is the most economical. No paving material is of universal application and every mistake in location is costly.

In any city there are new, outlying residential streets along which the property is cheap and builds up slowly. These streets need an inexpensive pavement of a temporary nature until the public utilities have been laid beneath the street and the property built up. Heavy grades and soil conditions may also require paving streets through long stretches of vacant property either to protect them from washing or to provide traffic communication with other property lying beyond. In these cases, the pavement which gives the most service for the money invested is the plain concrete paving.

Serious mistakes can be made in the selection of a pavement without a close study of local conditions and probable future traffic needs. There is no form of pavement which is satisfactory under all conditions. In fact specifications are being constantly improved and revised in order to get a construction which will withstand the increasing severity of traffic. Not many years ago the advent of the pleasure automobile upset country highway construction; now the arrival of the 5, 10, and even 15-ton auto-truck is causing consternation among municipal engineers. Every tendency toward increased auto-truck traffic decreases the importance of the wearing surface and increases foundation troubles. The problem of providing a pavement which will weather and

Gravel & Rock Company, Niles, Cal., Showing Track and Loading Facilities, Ground Storage Piles, Etc. Every Ten Hours

sustain loads—the prime conditions to meet in auto-truck traffic only—is simple enough. But the selection and specification of a pavement which will not only meet the present mixed traffic but will also prove satisfactory for the probable future development of fifteen or twenty years, the minimum life of a good pavement, becomes a serious question. Care and money spent by the citizens in seeking expert advice on the subject of paving, mean the saving of large amounts in the future.

Niles Sand, Gravel and Rock

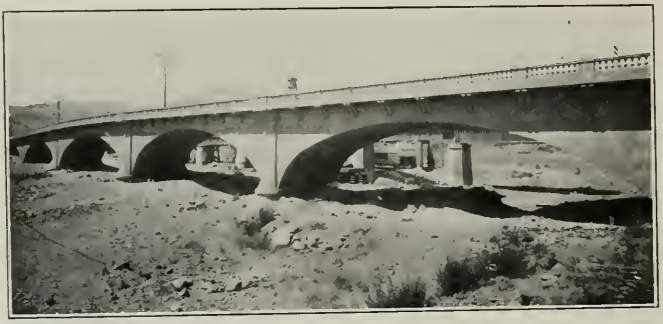
Since it established its plant at Niles, California, about two years ago, the Niles Sand, Gravel & Rock Company has enjoyed a steady increase of business, oftentimes finding itself taxed almost to the limit of its capacity. Below will be found a list of some of the more important construction work in connection with which Niles crushed gravel and concrete sand were used. President W. H. Ford is especially pleased with the Niles bridge job, which, on account of its peculiar type, called for the very best concrete materials. This bridge was designed by County Engineer P. A. Haviland of Oakland.

Niles Sand, Gravel & Rock Company's materials are used in the construction of the foundations, etc., of many of the World's Fair buildings, San Francisco; also the alms house, San Francisco; Shattuck Hotel, Berkeley; Standard Oil Company's buildings at Richmond and Paraffin; the Elks' buildings in Richmood and San Jose; Dalzell Building, Oakland; Stanford Court Apartments, Pine and Powell streets, San Francisco; Bohlig apartments, Pine and Powell streets, San Francisco; La Sonoma apartments, Turk and Larkin streets, San Francisco; California Ink Company's buildings, West Berkeley, and for many bridges, streets and highways throughout Central California, as well as for construction of piers, wharves and sea walls on the San Francisco water front.

Concrete Road Cost $5 Per Mile for Upkeep

So much interest has been expressed throughout the country by city, county and State officials, farmers, automobile owners and others as to the concrete highways to be built by the Lincoln Highway Association, that some facts have been collected relative to them for general distribution.

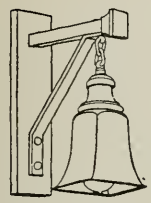
Wayne county, Michigan, in which Detroit is situated, is credited with having the finest system of concrete roadways in the world. They are over 100 miles in length and are to be the model for the Lincoln highway. The upkeep expense is less than $5 per mile a year, which includes the cleaning of ditches and the cutting of weeds along the roadside. They are always smooth and dustless.



Reinforced Concrete Bridge, Niles, Cal., 110-Foot Arches, with 18-Inch Concrete Slabs Designed by P. A. Haviland, C. E.

Practically every government report issued during the last five years has told of the failure of the ordinary macadam road to withstand the traffic of the present day. In New York State the maintenance expense has gone as high as $1000 a mile a year. The concrete highway which originally cost a third more, is practically permanent.

Concrete roads must be placed honestly as to the proportion of the gravel, sand and cement; they must be "cured," that is, watered and allowed to stand for several weeks before being used, and they must be built under good weather conditions.



Heating and Lighting

Plumbing and Electrical Work

Importance of Good Lighting

By F. PARK LEWIS*

THE importance of good lighting in public buildings is so self-evident that it would not require mention were it not for the fact that often in the finest specimens of modern architecture this seems to have been overlooked.

Some time since I happened to be in one of the progressive Western cities where the State House, a splendid edifice located on a hill, and notable for its beautiful approaches, was so poorly lighted that on entering the relatively small doorway on a clear, sunshiny morning it was found that the entire main floor was artificially illuminated, and the basement floor, in which were situated some of the most important offices for the transaction of the business of the State, could not have been used were it not for the artificial lights employed. Unhappily, this is not an exceptional circumstance; a like serious defect is found in the multimillion dollar State Capitol at Albany, New York.

In our auditorium the lights, to paraphrase the meaning of the apt French expression, "jump to the eye." In unnumbered public schools today, in which artificial lights must be used, the children are facing flickering gas lights in a vain attempt to see the marks on shiny blackboards. The school authorities have not yet learned that dark red and green walls absorb the light and for this reason the children are suffering.

The time has fully arrived when an authoritative body, composed of architects, of illuminating engineers, of schoolmen, of ophthalmologists and of all others who have to do with the management of light or the use of the eyes should collaborate in the development of authoritative plans for the education of the public on sight protection. The American Medical Association is now forming a sub-committee from the medical societies in every State in the Union on the Conservation of Vision. The National Education Association is deeply interested and is now ready to support any proper effort for broader instruction on the care of the eyes.

It was proposed several years ago that there might be one day in the year given to the Conservation of Light. It would be of great interest to the children to study the condition of their own school. In this respect their essays might include the physics of light illumination, natural and artificial; the amount of window space necessary for a well-lighted room, how it should be placed—in a word, the hygiene of the eyes. The study which this would necessitate would give a groundwork of knowledge which would insure better conditions in the future than exist at present. It would constitute a practical lesson on one of the essentials of right living and would result in collateral benefits of inestimable importance.

Close study of the value of good lighting is one of the most important subjects that can demand our attention.

*President of the American Association for the Conservation of Vision. Paper read before the Seventh Annual Convention of the Illuminating Engineering Society, Pittsburgh, Pa., September 22-26, 1913.

Factory Lighting and Workmen's Compensation

THE State of California Workmen's Compensation, Insurance and Safety Act (Boynton) which becomes effective January 1, 1914, contains clauses of especial interest to the electrical trade and closer familiarity with the requirements of the act may open up new channels for improved standards, together with the remodeling of existing lighting installations.

In the past, appeal for better lighting has been made to the employing interests upon the grounds that it meant increased output, better workmanship and a minimum spoliage. There now enters another and perhaps stronger factor to be considered, viz: the safety or protection of employes.

In the East, poor artificial illumination of workshops has been construed by the courts as contributory negligence on the part of employers where such poor illumination existed at the time an accident occurred.

In the Boynton Act (Chapter 176 of the Laws of 1913), no specific mention is made of good lighting as a factor of safety, but sub-section 9 of section 52 reads:

> The terms "safety device" and "safeguard" shall be given a broad interpretation so as to include any practicable method of mitigating or preventing a specific danger.

It is probable that inadequate, inefficient or otherwise unscientific lighting constitutes a specific danger.

The employers' liability to provide reasonably safe employment is very definitely stated in section 52, which is as follows:

> Every employer shall furnish employment which shall be safe for the employes therein and shall furnish a place of employment which shall be safe for employes therein, and shall furnish and use such safety devices and safeguards and shall adopt and use such practices, means, methods, operations and processes as are reasonably adequate to render such employment safe, and shall do every other thing reasonably necessary to protect the life and safety of such employes.

It is somewhat early, although not too early, to anticipate just what the commission will order as regards illumination standards made by them under subsections 1 and 2 of section 57. To date, no rules have been published, although liability of employers under this act commences upon the day on which the act goes into effect.

Early in this year, the committee of the Illuminating Engineering Society on factory lighting made certain recommendations to the New York Legislature bearing upon factory lighting, and as a result Bill No. 26 of the laws of the State of New York entitled, "An Act to amend the labor law, in relation to the protection of employes operating machinery, dust-creating machinery and the lighting of factories and workrooms," was signed by the Governor April 17, 1913.

The section of the bill which relates particularly to the lighting of factories, passageways and workrooms, is as follows:

> All passageways and other portions of a factory and all moving parts of machinery which are not so guarded as to prevent accidents, where, on or about which persons work or pass or may have to work or pass in emergencies shall be kept properly and sufficiently lighted during working hours. The halls and stairs leading to the workroom shall be properly and adequately lighted, and a proper and adequate light shall be kept burning by the owner or lessee in the public hallways near the stairs, upon the entrance floor and upon the other floors on every work day in the year, from the time when the building is open for use until the time it is closed in the evening, except at times when the influx of natural light shall make artificial light unnecessary. Such lights shall be so arranged as to insure their reliable operation when through accident or other cause the regular factory lighting is extinguished.
>
> All workrooms shall be properly and adequately lighted during working hours. Artificial illuminants in every workroom shall be installed, arranged and used so that the light furnished will at all times be sufficient and adequate for work carried on therein, and so as to prevent unnecessary strain on the vision or glare in the eyes of the workers. The industrial board may make rules and regulations to provide for adequate and sufficient natural and artificial lighting facilities in all factories.

It is not to be expected that the Industrial Accident Commission of the State of California will draft rules any less complete, and if such be the case, then it is necessary that all interested central station salesmen, engineers, contractors and supply salesmen should make an early and special study of this important subject of factory lighting, for the narrowest construction which can be placed upon the act shows that it is necessary that all factories be lighted properly and in accordance with the most advanced principles of scientific illumination.

Considerable educational effort is essential, for much has to be accomplished in a short time. The requirements are revolutionary. It has been the practice in the majority of installations to give the least possible attention to this subject of correct lighting and only a salesman of factory-lighting reflectors, or an illuminating engineer, knows just how difficult it is to instill into the minds of employers the necessity for adequate lighting equipment notwithstanding the demonstrable fact that "it pays." Pays because of a possible increased output, reduced spoliage, improved product, and the reduction of accident risks to a minimum.

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The Case of the Heating Contractor Against the General Contractor

Under the heading of "An Appeal to Architects, Consulting Engineers and Others," the National Association of Master Steam and Hot Water Fitters is sending out a leaflet expressing "the unsatisfactory conditions that now exist as the result of the practice of including the heating, ventilating and power plant equipment in the general building contract." One of the points brought out in the leaflet is that the general contractor seldom if ever awards the contract to the heating contractor whose figure he used to win in the contract. How this comes about is explained in the leaflet: "After the contract has been awarded to him, he starts in to get new figures, often stating in his requests for new estimates, 'We have been awarded the general contract,' etc., etc., showing plainly he is not dealing in a fair manner with the parties who originally estimated for him and helped him to obtain the contract."

General contractors are classified as: "Those who meet their obligations, whether the owner pays them or not; those who meet their obligations upon receipt of payment from the owner; those who receive payment from the owner and pay the sub-contractor only when compelled to do so; those who never pay at all; those who award the contract to the lowest bidder whose estimate they received when estimating the work; and those who ask for and receive estimates from which contracts are awarded who then compel sub-contractors to refigure work, before subletting."

The leaflet closes with a request that principals deal directly with heating contractors, on the ground that when the owner or architect does this he will get a better apparatus and also save money, "as the general contractor must add his profit to the estimates received."

Lofty Bell Tower Begun

With an acrobatic mechanic clinging to its top, the first nine-ton steel column for the new $200,000 Sather Campanile has been swung into place, and the University of California's great bell-tower has started its 300-foot climb toward the sky. It will be completed by 1915. Slender and lofty, its gleaming walls all of white granite and marble, the Sather Campanile will be a splendid landmark, visible from ocean vessels as they enter the Golden Gate and from all the cities clustering around San Francisco Bay. It is a memorial to its donor, Mrs. Jane K. Sather of Oakland, giver of many rich endowments to the University of California. In the open belfry will hang the Sather bells, for which Mrs. Sather gave a special gift of $25,000. From these chimes the University hymns, patriotic airs, or any other melodies desired may be rung out. Of noble grace, dignity and beauty, precious in material, in mass and height comparable with such structures as the Campanile of Venice, Giotto's tower in Florence, and the Giralda of Seville, and itself a keynote for the surrounding landscape and architectural glories of the Berkeley campus, as developing under the great Hearst plan, the Sather Campanile is destined to become one of the world's most famous towers.

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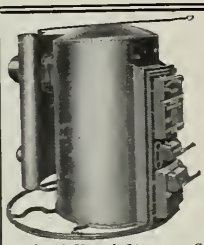

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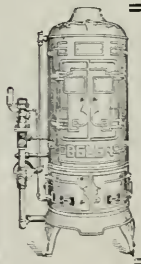

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Quarrying Industry in California

Reports made to the United States Geological Survey show that the total value of the quarry products of California, which consist chiefly of granite, trap rock and limestone, decreased from $4,676,902 in 1911 to $3,902,313 in 1912. Doubtless a part of this decrease may be attributed to a cessation of the tremendous building activity that followed the fire and earthquake in San Francisco. But a part of it may be due to the adoption of cheaper and flimsier construction. The State is wealthy and is growing more rapidly than most of the American commonwealths, and its quarrying and stone-working industries should show a steady increase.

$193,000,000 Fire Losses

Losses by fire in this country and Canada in the ten months ending October 31 were $193,000,000. These figures are slightly in excess of those of the same period in 1912 or 1911. The fire loss this year will apparently be about equal to that reported in 1912, or say, $225,000,000. At this rate the fire loss and waste approximates annually to an amount equal to 25 per cent of the national debt. The United States greatly exceeds other nations in fire losses and while the subject is always under serious discussion the waste goes on at about the usual rate.

Concrete Band Stand

Preliminary plans have been prepared for a reinforced concrete band stand for Alum Rock Park, San Jose, Cal. It will cost about $10,000 and will probably be erected and paid for by private capital.

National Arts Club's $1,000 Prize

The National Arts Club offers a prize of $1,000 for the best literary production to be entitled "A Critical Estimate of the Altman Collection," to be submitted by one of its members before March 1, 1914. It is hoped that in this way popular interest will be further stimulated in the munificent gift of the late Mr. Altman and that a monograph may be elicited from the contest which shall form the standard work of appreciation of the collection for all time to come. The manuscripts will be submitted anonymously and the jury of award will be announced later.

Mr. Sutton as Railroad Manager

The friends of John G. Sutton, the well-known head of the electrical and heating firm of John G. Sutton Company, San Francisco, are pleased to learn that he has been appointed vice-president and general manager of the Ocean Shore Railroad, having full charge from December 1. Sutton is successor to Alfred Williams, who died November 14. It is the hope of the directors that the appointment of Sutton will result in the purchase of the proposed $200,000 bond issue of the company by the real estate owners along the right of way.

Plans Being Prepared

Architect Orville L. Clark, Brower Building, Bakersfield, is preparing plans for a new county jail building to be erected for Kern County supervisors at Bakersfield at an estimated cost of $150,000. Mr. Clark's plans were accepted in competition. The building will be 100x112 feet with steel frame, brick walls, and concrete floors and roof.

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A Poor Fireplace in an Architect's Home

(From the Sacramento Bee.)

The fireplaces that are being built in some of the modern bungalows in Sacramento are fire menaces, according to Chief C. W. Anderson of the Fire Department.

"The new fireplaces they are building are constructed on a wood foundation, and when they dry out the mortar opens up and the fire drops to the wood with the result that you have an inside fire that is hard to combat. We have had many such fires of late, particularly in new bungalows.

"Sunday the boys worked for three hours on the home of Architect George C. Sellon, on Riviera avenue, trying to get at the fire without cutting the house to pieces. Usually they have to cut a hole in the side of the house to get at the smouldering fire."

Architect Ratcliffe Busy

Architect W. H. Ratcliffe, Jr., of Berkeley is just now one of the busiest architects in Northern California. In addition to designing a number of fire houses for the city of Berkeley he has on the boards an $80,000 apartment house to be erected at the corner of Telegraph avenue and Durant street for Messrs. Elston & Clark, and which will contain 34 apartments of two and three rooms each; also a Bachelors' Club House at Stanford University for Douglas Campbell and Professor Allidile, to cost about $10,000, and a number of small cottages. The Berkeley Elks' building, also designed by Mr. Ratcliffe, is under construction.

New York's Next Skyscraper

Howells & Stokes will be the architects of the next great tower building in New York, to be called "Trinity Tower," and to stand in Trinity place, opposite the churchyard, from which it will have permanent light. The achitect of the first really world-famous tower building, the World Building, was George B. Post, and within the last decade the names of the Messrs Le Brun, Ernest Flagg, Henry Ives Cobb and Cass Gilbert have been added to the list of architects of extremely high towers.

Certificated Architects

The State Board of Architecture, Northern District, at a meeting held on Tuesday, November 25, granted certificates to the following:

Charles R. Johnson and Irving F. Morrow of San Francisco, Ernest L. Norberg of Burlingame, Lester H. Stock of San Jose, Hugh Y. Davis of Visalia, Frank L. Thomson of Eureka and O. R. Baxter of Sacramento.

D. H. Burnham's Estate

An inventory of the estate of the late Daniel H. Burnham, architect, of Chicago, was filed recently. It showed assets of $1,103,000, exclusive of stocks in nineteen corporations and bonds in nine others, the value of which was not given.

Demand for Nason's Opaque Flat Finish

R. N. Nason & Company, the well-known oil and paint makers, whose factory is in San Francisco, and who maintain branches in Portland, Seattle and Los Angeles, report a steadily increasing demand for their famous Opaque Flat Finish, a washable paint for inside walls. The company are the exclusive manufacturers of this product. Architects who have used it state that it gives excellent satisfaction. Painting contractors unhesitatingly declare that its covering capacity is greater than that of any other similar product. The manufacturers claim that a smaller quantity of this paint is required to cover a given area than of any other similar preparation on the market. The finish may be tinted any color and is especially intended for the wall surfaces of hallways, corridors and bathrooms.

Among the recently constructed buildings in San Francisco, the fifteen-story hotel on Grant avenue near Bush, designed by Architect Kenneth MacDonald, offers a good example of the possibilities of the Nason product. The halls of all 15 floors, as well as all the bathrooms, are painted with two coats of Opaque Flat Finish. The new Spreckels building at the gore of Market, Golden Gate avenue and Taylor street is now being painted with Opaque. This is a three-story store and office building designed by Architects Miller & Colmesnil. Another building is the hotel at Gough and Market streets. Gus V. Daniels is the painting contractor here, and he is said to be doing a splendid job. The nurses' wing of the new City and County Hospital has been given two coats of Opaque with fine results.

R. N. Nason & Company are also the California distributors of Bay State Brick and Cement Coating, a product that permits a most artistic treatment of cement surfaces. Bay State Coating is manufactured by Wadsworth, Howland & Company of Boston. In this product it would seem that they have solved the problem of manufacturing a coating in every way applicable to cement. It furnishes a durable, pleasing exterior finish without showing a painted effect and at the same time is unaffected by dampness or alkali action.

Another product that the Nason Company is handling in very large quantities is the Tamm & Nolan varnishes for residence and interior work. These varnishes are known all over the coast and have been in use so many years that any extended description would be superfluous.

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By the Way

Some Industrial Information Worth the While

Berger's Metal Shingles and Spanish Tile Roofing

Metal roofing tile is now being reproduced which is an exact pattern of the original clay Spanish tile and makers of the sheet metal product call attention to the light weight of that material, which is a very important consideration in connection with the question of freight shipment. Some new designs in this class of material are well illustrated in a new catalogue of the Berger Manufacturing Company, Canton, Ohio, in which colored half-tone cuts are used to show the different styles of tile and their adaptability for use in various classes of construction work. These Spanish tile sections and metal shingles are furnished in either Toncan metal, or open-hearth steel. The former is a sheet metal product made from an iron ore base and for which the manufacturer claims superior rust and corrosion-resisting properties. The brands known as Chieftain and Swanee metal shingles are also manufactured of terne plate of any standard weight of coating. The construction of the tiles provides for expansion and contraction. It is claimed that the weight of a metal section is about one-eighth of that of similar designs manufactured of clay, thus permitting the use of a lighter roof framing. In laying the metal shingles the section is locked into the adjacent section and then nailed in position. The heads of the nails are covered by the next shingle, placed in position, and the ribs formed at the top of each shingle prevent the access of rain or snow. Several different styles of ribbed and hip capping, valleys, terminals and finials are shown. In laying metal shingles it is recommended that the start be made at the lower left-hand corner of the roof section. The first course is laid so that the shingles project over the eaves about one inch or more, a chalk line being used to keep the course straight at the bottom. At the end of the building (except when gable end finish is used) the tile is allowed to project about one inch over

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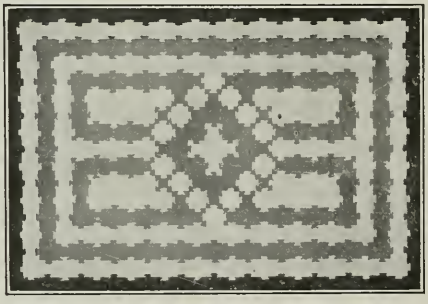

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the verge-boards and the sides are turned down and nailed. In laying the second and subsequent courses every alternative course is started with a half tile to break joints.

Brownhoist Buckets and Tubs

A splendid catalogue has just been published by the Brown Hoisting Machinery Company, which has a branch office in the Monadnock Building, San Francisco.

In this catalogue are descriptions and illustrations of the Brownhoist grab buckets, slag buckets, contractor's grab buckets, shovel buckets, and various kinds of tubs as designed and manufactured by this company. Brownhoist buckets and tubs are being used in practically every part of the world.

With this varied line of buckets and tubs, the company professes to be in a position to solve any bucket or tub problem, no matter what the material may be nor how the bucket is to be handled.

All the Year Round Building

Eastern manufacturers, who remain dormant all winter waiting for warm weather to return, do not realize that on the Pacific Coast there is a twelve-months' market for their goods and that they can do business here when there is a stoppage on the Atlantic Coast and other Eastern points. Nineteen hundred and fourteen, as the year of preparation for the Panama Exposition, offers an excellent opportunity to exploit and introduce their specialties in this market.

New State Hospital.

The commission apnointed by Governor Johnson to select a location for a new State hospital for the insane has purchased a tract of 325 acres on the Santa Fe Railroad, 15 miles southeast of Los Angeles. Plans for suitable hospital buildings to be erected on the site are now being made by State Architect McDougall in Sacramento. The amount available for the buildings is $140,000.

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Banquet of the Clay Products Interests

ON NOVEMBER 22, 1913, the members of the Brick Builders' Bureau of San Francisco called the manufacturers of and the workers in clay products and structural steel of the State together for the purpose of determining the course of co-operation of those interested in these most important branches of building work. Producers and workers in brick, tile, terra cotta and structural steel met in a business gathering in the afternoon, and later in the evening a most enjoyable banquet was served at the St. Francis Hotel. Both the business meeting and banquet were splendidly attended and showed conclusively the interest displayed in a reorganization of the Bureau upon a sounder, more substantial basis. Many items of interest to the industry were discussed and gone over. A prime consideration was the size of the present common brick on the market in San Francisco and ways and means of making a standard size that the manufacturer, architect, designer and all who use brick may have a standard to work to, and not as many sizes as there are manufacturers. There was adopted a standard size brick to be 2⅝" x 4" x 8⅛", and thus also necessitate the ordinary face brick to be the same size. A committee of the Bureau was appointed to determine the time of effecting the change without in anywise disturbing the manufacturers' business. It will soon report to the Bureau its findings, and then one of the most vexatious questions of the industry will be settled by everyone concerned in the manufacture or use of this material. It was the consensus of opinion to organize the Bureau to give building facts and make it of practical use to all concerned in construction work to show to the whole Pacific Coast the superior value of burnt clay in modern structures and foster a campaign of education for the use of brick, terra cotta, tile and structural steel.

The harmony displayed by the several interests involved at the meeting certainly means an impetus to the work of disseminating high-class building information to the owners of buildings.

Several plans of improving the construction of work that it may be held to a higher standard were outlined, and the Bureau will gather all technical information on brick and brick construction, with details, and most likely put such in condensed form for general use. The latest book of the Bureau was examined and was ordered distributed at an early date.

The general enthusiasm of the whole meeting surely attests to the fact that all concerned are united in their efforts to place the industry upon a better basis and give to the public better construction. Mr. W. E. Dennison, President of the Bureau, carried the meeting and banquet to a splendid final conclusion in his capacity as toastmaster of the evening.

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Store-Fronts as Silent Salesmen

The commercial value in retail merchandising of a well-designed store-front is dwelt upon in a pamphlet recently issued by the Kawneer Manufacturing Company, Niles, Mich. This pamphlet has for its title "Boosting Business," and may be had on application.

In these progressive days of keen competition, good merchandise, the dependable kind, must surround itself with an equally good environment. People trained as they are today in more aesthetic habits of thought and action, will frequent the attractive store in preference to one that does not seek to cater to these well-defined characteristics. All these advantages of good modern construction in store-fronts are well illustrated by actual installations in the pamphlet under consideration. An interesting feature in the presentation of pictures of the stores before and after the introduction of Kawneer "fronts."

The mechanical details, sectional drawings and the various matters that will interest and influence architects in selection are not overlooked. The pamphlet will be found exceedingly helpful in store-front construction.

Natatorium for Alameda

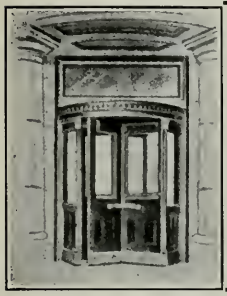
Alameda is to have the largest natatorium and attendant buildings in the West and one of the best equipped in the country, work on the big project to begin as soon as the elaborate plans have been completed by the architect, A. Mazurette of Oakland. A company to launch the plan has recently filed articles of incorporation, with a capital stock of $200,000, of which $40,000 has already been subscribed. The plans call for special provision for women and children, and all facilities for summer and winter bathing and swimming.

Nice Contract for Graham & Jensen

Messrs. Graham & Jensen, who specialize in country buildings such as school houses, banks and court houses, have recently been awarded the contract to erect the new high school at Orland, from plans by Architect W. H. Weeks of San Francisco. This firm stands very high in the building world and its class of work is rated with the best. General offices are maintained in the Builders' Exchange Building, San Francisco.

A New Granite Center in California

The California Granite Works, now operating at Rockland, Cal., has purchased sixty acres of granite deposit on Rocky Hill, Porterville, Cal. Adolph Pernu, president of the company, announces the intention of making this the center of the extensive operations



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The Majestic Foundation Coal Chute

The Majestic Chute is designed to be placed in the foundation wall for depositing coal, wood or vegetables into the cellar. It affords splendid protection to the building and saves the side of the house from becoming damaged by careless coal deliverers, as the door locking automatically open protects the building just where the protection is needed and instead of throwing coal carelessly against the side of the building as is the case with an ordinary cellar window, it strikes the door, falls into the hopper and passes to the basement without being scattered upon the lawn and without permitting the dust and dirt to disfigure the side of the building. When the door closes it locks itself automatically and can only be opened from the inside, making it burglar proof.

The body of the chute is made of heavy steel. The door and frame are made of the best quality of gray cast iron, the hopper is of twelve gauge boiler plate and is so designed that when not in use it lies in the bottom of the chute body, allowing a full ray of light to shine in. All parts are thoroughly painted.

There is an interchangeable feature whereby the chute can be used as a window if desired.

The chutes are made in two sizes and six styles, No. 10 for residence use and No. 20 for schools, churches and public buildings where the architecture naturally requires a larger chute. If desired, a chain attachment can be furnished whereby the user can open the chute without going into the bin. It consists of ten feet of American chain attached to the gravity latch and running through the necessary pulleys.

Architectural Details of Hollow Metal Door Construction

A portfolio of architectural details of hollow metal door and trim construction has just been issued by the Dahlstrom Metallic Door Company of Jamestown, New York. It is the most attractive and complete set of details for such construction that has been issued up to this time for free distribution to architects.

The value of steel interior finish for high-class buildings is being more and more appreciated by architects, builders, owners and managers. Extended information regarding the best practice in hollow-metal door and trim construction and its adaptability to varying designs, conditions and requirements is therefore timely and will serve a useful purpose.

The original drawings for these plates were made by men in their own organization under the supervision of Mr. Henry Wilson and additional plates will be issued from time to time to show new developments in the art. The portfolio will be sold to parties other than practicing architects, at $5.00 each.

A Master Painter

Architects and large contractors who require interior work of any considerable magnitude, frequently are at a loss to find a good painter and decorator whom they can depend upon to do a really high-class piece of work, especially on public buildings, hotels and office buildings.

Mr. Horace W. Tyrrel of 1707 38th Avenue, Oakland, has for several years made a specialty of high-class out-of-town painting and decorating. He is now engaged on the Y. M. C. A. Building, Sacramento, E. C. Hemmings, architect; and a large four-story hotel at Stockton designed by Architect Walter King. Recently he completed the El Dorado County courthouse at Placerville, under Architect C. C. Cuff.

Architects and contractors desirous of getting some high-class painting and decorating should confer or correspond with Mr. Tyrrel.

New Bank for Healdsburg

On account of the growth of the Healdsburg National Bank, Healdsburg, Cal., the officers of the institution have decided that they need a building commensurate with their position in the financial world, and a deal has been completed whereby the bank becomes the owner of the Meyer Estate property, at the corner of West and Powell Streets. This property has a frontage of 132 feet on Powell Street and 62 feet on West Street. Plans for the new building have not been completed as it will be some time before all the leases on the property expire.

Concrete Posts for Trolley Wires

At a conference between the San Francisco Supervisors' public utilities committee and City Engineer O'Shaughnessy the latter exhibited drawings of concrete piers he proposes to use instead of iron poles for the trolley wires of the municipal railway on Van Ness avenue. The piers will be decidedly ornamental. Short arms set at right angles to those holding the wires will support ornamental lamps.

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Architects Specify The "Red Sentry Pump" With Lighting Device Attached

Those who attend the 1914 Automobile Shows at New York and Chicago will be interested to know that as usual S. F. Bowser & Company of Fort Wayne, Indiana, will have on display a complete line of gasoline and oil storage equipment suitable for private, public and commercial garages. The line consists of self-measuring and non-self-measuring hand and power driven pumps, underground storage tanks, self-registering line measures, etc.

The exhibit will be in charge of men of wide experience in planning and recommending gasoline and oil storage suitable to every existing condition. The policy of S. F. Bowser & Company has always been to improve and add to their line of equipment as trade conditions require. At last year's show they appeared with their new "Red Sentry" pump, with electric light attachment, their non-overflow filler for hand oilers and other new devices designed to facilitate the storing and handling of gasoline and lubricating oil.

This year they will show several new pumps and an improved light attachment for the "Red Sentry" pump, which are distinctly a departure from anything heretofore put on the market, for the handling of gasoline. They will also show a general exhibit of standard pumps, tanks and accessories. One of their new pumps discharges at a full stroke of the plunger an accurate gallon. Intermediate stops are provided for half-gallons, quarts and pints and a graduated scale enables the operator to discharge accurately intermediate quantities. This pump is equipped with an automatic meter which registers all liquid discharged from the pump up to 100,000 gallons and then repeats. It also has a set-back counter which registers up to 100 gallons and can be set back to zero whenever desired. These two features are a great convenience, as they enable the operator to tell exactly how much gasoline has been pumped at one operation and also keep a continuous record of all liquid discharged from the pump. The Bowser centrifugal filter with which the pump is equipped takes all water and other impurities from the gasoline as it is pumped. The pump is so designed that the plunger is returned to its original position with only one turn of the handle. This makes the operation of the pump very rapid.

Another new pump which the Bowser Company have recently perfected discharges at a full stroke of the plunger five gallons. Stops are provided for two gallons and one gallon; also a graduated scale which enables the operator to discharge accurately and quickly any intermediate gallon, half-gallon, quart or pint. The pump is virtually one of a maximum capacity of five gallons and a minimum of one pint. This pump is also equipped with a continuous counter, or meter, registering up to 100,000 gallons; a discharge register, tallying from one to ten and repeating. The pump also has the quick return feature the same as the one-gallon pump. This equipment is built to conform to that measure of safety prescribed by the National Board of Fire Underwriters, which means the maximum degree of safety to the user.

These pumps, while being solidly constructed of heavy metal, are neat and graceful in design and occupy but very little floor space. Being well finished in black and red enamel with full nickel trimmings, they present a very attractive appearance. They are just the right height to make operation of the pump easy. Anyone attending the shows should not miss the opportunity of seeing the Bowser line. Descriptive literature illustrating this new equipment will be gladly furnished to anyone on request. See advertisement for nearest Coast branch.

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Advantages and Conveniences of Installing Sliding Doors in the Modern Home

In the contest recently conducted by the Richards-Wilcox Mfg. Company, Aurora, Ill., in 200-word articles dealing with the subject indicated by the above title, the third prize went to H. H. Cahoon, an architect in Pittsburgh, Pa., and his contribution to the literature of the subject consisted of a series of verses which are of such a clever nature that we publish them herewith for the benefit of Architect and Engineer readers.

They tell us there is not a thing
Beneath the sun that's new,
But you'll agree, I think, with me
When I present a few.

The first one and the foremost,
Our forebears gave no glance;
"Economy" applies to space
As well as to finance.

Take all those lovely palaces,
The entire old world o'er;
Not one of them, as you will find,
Contains a Sliding Door.

Much less an R-W hanger,
Another thing that's new,—
The acme of perfection,
A thing that's tried and true.

A sliding door's a wondrous thing,
It saves a deal of space;
And doesn't have the slightest chance
To strike one in the face.

Those swinging doors will cause mishaps,
If one neglects to look;
They'll cause "downfalls of china,"
And a very "upset" cook.

An architectural point of view
Presents the matter thus—
We slide the door of *one* room
And discover one room *plus*.

'Tis the duty of the architect
To specify this thing;
Which makes a door a better door
Without that needless swing.

To "efficiency," "convenience,"
And "economy of space,"
Add a Richards-Wilcox hanger
And the Ideal door's in place.

The Twin Peaks Tunnel

According to the City Engineer's plans, the construction of the Twin Peaks tunnel in San Francisco will take 600 calendar days. He says that 500 to 700 men will be employed on the work, and that fully $2,000,000 will be paid in wages, which will find a way into the channels of trade in San Francisco.

As the extension of Market street, together with the scenic boulevards plan, are all a part of the Twin Peaks improvement plan, it is believed that fully 1,000 men will have work for the next year and a half.

For many months the progress of the big engineering feat, which is to give San Francisco the largest tunnel in the world for suburban traffic, has been watched with keen interest in the big business centers of the East.

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If interested in concrete construction, we will be glad to receive your request for descriptive matter concerning "HERCULES" WATERPROOFING. We have hundreds of illustrations descriptive of its use, and will forward those explaining the use and results in which you are most interested.

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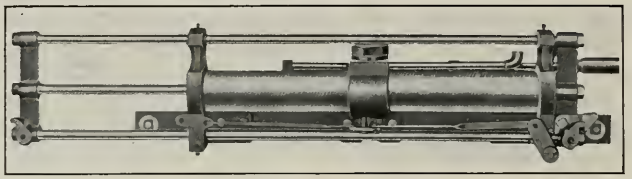

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Both by letters and telegrams City Engineer O'Shaughnessy has received many urgent requests from leading engineering journals and other publications for technical data and articles dealing with Twin Peaks tunnel.

To comply with these requests and to give the public an opportunity of becoming familiar with the technical and engineering features of the project, the City Engineer is now preparing a prospectus giving detailed information about the $4,000,000 rapid transit tunnel which is now assured.

Smiles

Pat and Mike were working on a new building. Pat was laying brick and Mike was carrying the hod. Mike had just come up to the fourth floor when the dinner whistle blew. His lunch was on the ground.

"I hate to walk down after it," he said.

"Take hold of this rope," said Pat, "and I'll let you down."

Pat let him down half way and then let go of the rope. Mike landed in a mortar bed, not much hurt, but terribly mortified.

"And why did you let go of the rope?" he demanded.

"I thought it was going to break," said Pat, "and I had presence of mind enough to let go."

* * *

McFee lived in Brooklyn, but moved out. One of the men in the office asked him what was the greatest charm of his new home.

"The bath room," he replied. "My wife thinks it so cute she can hardly wait for Saturday to come, so that she can try the tub."

* * *

Casey—You're a har-rd worruker, McGinness. How many hods o' morther have yez carried up that ladder th' day?

McGinness—Whist, man, I'm foolin' th' boss. I've carried this same hodful up an' down all day, an' he thinks I'm worrukin'!

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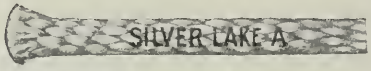

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Patent Interlocking Brick for Sewers and Storm Drains

A New Brick for Large Diameter Sewers

One of the interesting exhibits that attracted more than casual notice from the large number of engineers visiting the convention of the League of California Municipalities at Venice in October was that of a section of 5-foot sewer constructed of a new brick recently patented by Chas. H. Frost, chairman of the board of directors of the Los Angeles Pressed Brick Company, and which that company is now preparing to manufacture in any quantity. Dies are being completed for the special moulds required for any size of sewer and the company will compete for the large sewers and storm-drains with this brick.

As may be seen from the illustration, the brick is wedge-shaped, so designed that it will make a perfect arch with a very thin mortar joint. Each brick has tongue and groove to make an interlocking construction. The brick is made of selected clays and carefully burned. Tests of one-ring sewer sections to be built of this brick are soon to be made.

The clay products manufacturers, alive to changing conditions, are seeking ways and means to improve their products and to produce anything in burned clay that is required by modern construction. Several manufacturers are making tiles and special brick for large diameter sewers, realizing that ordinary brick make their use for this purpose too costly. The new brick to be produced by the Los Angeles Pressed Brick Company is expected to fill all requirements in addition to reducing the cost of brick sewers to a point where this type of construction will be again popular for diameters too large for the use of vitrified clay pipe. It will be easily and cheaply laid and the two longitudinal holes are expected to provide sufficient drainage during construction so that an underneath drainage pipe line will not be necessary.

Architect Herold a Benedict

The Sacramento Bee publishes the following:

His friends supposed that P. J. Herold, architect, with offices in the Forum building, Sacramento, went to San Francisco October 20 with his hydroplane to take part in the races, but it appears hydroplane racing is a minor consideration. A marriage license was issued by the bay city officials to Pete J. Herold and Miss Lola E. Eldridge, both of Sacramento.

Miss Eldridge is a niece of H. W. Sheridan, former division superintendent of the Southern Pacific Company. She was in the employ of the railroad company as a stenographer until last February, when she resigned and left for Chicago, where her parents reside. Herold is a brother of Rudolph Herold, architect, also of Sacramento.

Architects and Contractors of Portland, Ore., Are Interested

The Oregonian of November 9th contains the following:

A lecture on "Quantity Surveying," by G. Alexander Wright, a San Francisco architect and author,, was the feature of the luncheon which the Oregon Chapter of the American Institute of Architects gave at the Commercial Club Friday in Mr. Wright's honor.

"The ever-increasing amount of time and money contractors are called upon to spend in preparing quantities and prices for an owner's benefit," he said, "suggests the advisability of adopting a modern system of estimating, a system that will be in line with our progressive building methods, clear and accurate, that will stand for square dealing between contractor and owner and yet shall reveal, at a glance, the amount of material and labor in a structure. With quantity surveying, it is not necessary for a bidder to study the drawings and specifications at all. He simply prices the bills of quantities."

Mr. Wright insisted that quantity surveying saved time and money, gave greater precision in measuring, left no uncertainty as to the interpretation of plans and specifications, eliminated the necessity of visiting the architect for explanations while figuring, and exactly determined the amount of work to be done. Systematically arranged bills of quantities, he said, form excellent data for making future estimates.

"I am hoping," said Mr. Wright in conclusion, "to see a committee appointed soon in every builders' organization in this country, to take up and seriously administer such matters. Nothing else will so help to elevate the building business."

Wakefield Baker

In the death of Wakefield Baker on December 7th, San Francisco lost one of its most progressive and energetic business men. Mr. Baker was president of the well-known hardware house of Baker & Hamilton.

With his associate, Mr. Hamilton, he succeeded in building a business as large if not larger than any similar concern on the Pacific Coast. Mr. Baker was also president of the Pacific Portland Cement Company and the California Building Materials Company, both important factors in the building industry of California. Mr. Baker was everywhere recognized as an indefatigable worker, possessing keen business sense and wonderful executive ability. He was in touch with the minutest detail of all three concerns that bore his name. Mr. Baker was also a director of the Savings Union Bank & Trust Company and the Mercantile National Bank. He was only 47 years old.

John's Hanger Business Sold by Sheriff

According to the R. G. Dun Company, the business of the John's Hanger Manufacturing Company, of San Francisco, was sold on December 1 at sheriff's auction to A. H. Beetham for $1,250, in partial satisfaction of a suit for money advanced by him.

Creditable Marble Installations

In the work of Architects Righetti & Headman, illustrated in this issue, nearly all of the marble work was installed by the Joseph Musto Sons-Keenan Co., whose marble works and offices are at 535 North Point street, San Francisco. The following buildings might be mentioned: Jean Allec apartments, Ellis and Larkin streets; Baldocci & Crowley apartments, Bush and Chelsea place; "The Maryland," the Native Sons building, the Solari Grill and residences for J. B. Crowley and Angelo J. Rossi. With the exception of the fine building of the Native Sons, which was executed exclusively in California marble, all of the work mentioned was imported marble. Particular mention should be made of the "illuminated" onyx work on the exterior of the Solari Grill.

Paint Company in New Home

The American Paint & Dry Color Company, which was burned out some time ago, has moved into its new factory at 414 Ninth street, San Francisco. The building was designed by Architects Welsh & Carey and is a three-story structure. The walls are of reinforced brick, while the floors are of concrete, supported by heavy reinforced concrete beams and girders. All the interior doors are metal. The architects have endeavored to design a building that would be as near fireproof as possible. Only on the ground floor where the general offices are located is there any wood trim.

The new building gives the company about 30,000 square feet of floor space. Besides the general offices the ground floor contains the shipping department and sample rooms. The second floor is used largely for carrying the immense stock of the company, while the upper floor is devoted exclusively to manufacturing purposes.

In the basement are additional store and stock rooms. The company is having excellent success with its Cementoline, for exterior waterproof painting of cement structures, and also with its Alvaline, a sanitary, damp-proof, washable wall finish. Both of these paints have been used for the interior and exterior finish of the company's new factory, a photograph of which appears in their advertisement in this number.

Electrically Operated Westminster Chime of Bells Installed in Tower of Oregon Journal Building, Portland Oregon, by THE STANDARD ELECTRIC TIME CO.

Modern Architectural and Engineering Practice

By a Staff Writer

MODERN architectural and engineering practice requires a proper appreciation and adoption, not only of improvements and innovations of merit in the construction, but also those adapted to the equipment of buildings. The profession, at first, looked askance at cleaning, air-purifying and ventilating devices, but these are now a part of the standard specifications for all large structures. Eastern architects and engineers, where the building competition is especially keen, have been receptive of almost any worthy improvement, but, on the Pacific Coast, there has been a slower movement in this direction, owing to the reluctance of architects and engineers to adopt anything which would add to the initial cost of the building. Experience, however, has proven that labor-saving, health-preserving and comfort-giving improvements more than compensate for any additional cost by satisfaction given to owners and tenants and a corresponding increase of accrued rentals and other revenues. One of the most important improvements and one that is commanding the attention of architects and engineers generally, is an electrically operated clock system. While this has been in general use for a great many years in schools, industrial plants, etc., the appreciation of the adaptability of a clock system, giving accurate and uniform time in all modern buildings, public and private, where people congregate, is now growing among progressive builders. This is especially true of office buildings, apartment houses and hotels, where correct time is a factor of no small importance. Time, it is said by our lawyers, is the essence of every agreement, and, yet, how little effort is made to guard against the loss of valuable moments, arising from erratic and incorrect clock service. The tenant who can count with absolute certainty—by glancing at clock in corridor or office—on the correct moment when he must leave to keep appointments or catch a train, blesses the landlord for this convenience and is loth to leave a building where such a service is given. When to this is added the tower clock, not only the tenant but the outside public is attracted to the owner's enterprise, and who knows how many prospective tenants are included in the passing throng?

The electric clock service puts all of the elaborate mechanism in the Master clock, which is equipped with a movement of great precision, being electric-

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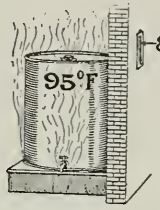

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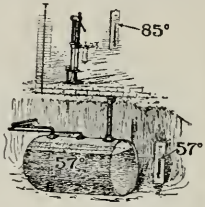

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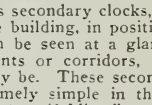

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ally wound, automatically, once every minute, with a compensating pendulum, adjusted for changes in climatic conditions, and this insures and secures absolute reliability and correctness of time. This Master clock transmits to the various secondary clocks, located throughout the building, in positions where the time can be seen at a glance in office, apartments or corridors, whichever the case may be. These secondary clocks are extremely simple in their mechanism and by "manifolding," so to speak, show the exact time, all the time, being under the absolute control of this fine and accurate Master clock. The secondary clocks of this system are not at all delicate, being designed to operate continuously without oiling, cleaning or attention of any kind.

While this shows the modern application of time sevice to office buildings, hotels, etc., there is a very great demand for it in hospitals, where accurate and uniform time is an absolute necessity in the performing of delicate operations, giving medicine, carrying out doctors' orders, etc.; also in schools, colleges, etc., where it is a positive necessity. This field is considerably broadened by the installation of a program instrument, which automatically transmits signals to rooms or departments, according to a prearranged schedule; for instance, for schools, the assembly and dismissal, the beginning and close of recitation periods, which are announced with precision, without the thought or attention of anyone, leaving the teaching staff to do their best work, without being interrupted by having constantly to think of the time. Or, in the case of industrial plants, department stores, etc., the arrival and de-

parture of employes adds to the efficiency of the enterprise. All this promotes discipline, regularity and order and saves the worry and expense incident to erratic, independent clocks, and signals which are given by hand. This program instrument is almost human in its action; for instance, during nights, Saturday and Sunday, when no signals are required in schools, it automatically silences all bells and begins the work again on Monday morning, or it will automatically change from one schedule to another, during any day or days of the week and change back again to the regular schedule, so that the most complex arrangements are carried out accurately, according to the particular requirements of the institution.

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We are eliminating from consideration the physical and historical and are treating solely with the commercial use of time.

Hearing from several architects that recent plans for large buildings were to include electric time service, one of our staff, with a view of investigating further as to the practicability of a larger development in this line, visited the offices of The Standard Electric Time Co., 461 Market street, San Francisco, and had a conversation with one of the officials of the company, Mr. J. J. Estabrook, vice-president, who stated as follows:

Our company is the pioneer in this field, having been manufacturing and installing electric clock systems in public and private buildings for over thirty years. It has been the policy of the company to put its own direct men in the field, who are trained in the factory and are competent engineers, especially educated by the engineering department, which is maintained by the company for the development, improvement and standardization of the company's product, in accordance with the best and most modern engineering practice. Because of this, our company is constantly in the lead, and, by having competent engineers in the field, we are always able to adapt our system to any existing conditions or requirements, on the ground, avoiding the necessity of each requirement being referred to headquarters, which necessitates delay and, invariably, unsatisfactory results. We maintain our own branch offices in all of the large centers of the country. Four years ago the company decided to enter the Pacific Coast field and a branch office was established in San Francisco. The Coast business has increased to the point where approximately 80% of the new schools contain our equipment. A number of fine hospital equipments have also been installed, such as the San Francisco City and County Hospital, which includes nearly 100 marble secondary clocks and an exceptionally fine Master clock; also St. Mary's Hospital and Mt. Zion Hospital, San Francisco; Hospital of the Good Samaritan, Los Angeles; St. Elizabeth's Hospital, North Yakima; Eastern Oregon State Hospital, Pendleton, Oregon, and the Provincial Mental Hospital, British Columbia. A number of very fine hotel equipments, such as the Canadian Pacific Empress Hotel, Victoria; Hotel Oregon, Portland; Hotel Oakland, Oakland, Cal., and a number of fine office building equipments, a few of which are Vancouver Block, Vancouver, B. C., on which is installed the largest clock in Canada and west of the Mississippi river, having four dials, 22' in diameter, and a full system of secondary clocks throughout the building. The B. C. Electric Railway Co.'s office building and station combined in Vancouver contains a large number of our secondary clocks and the time service is extended all over their lines throughout the city, clocks being operated in their various stations, junction points, power houses, etc., and in addition, banks, stores, office buildings, etc., have secondary clocks operated from their main Master clock. The B. C. Electric Railway Co. also have this service in Victoria, which is extended to the Parliament Buildings, having a large number of clocks. The Federal Building, Tacoma, Wash., is equipped with over 50 clocks, the Oregon Journal Building, Portland, has a complete system, including four 12' illuminated dials and a Westminster chime in the tower, containing four bells, total weight 4410 pounds. The bells are operated from the clock and are struck by a new electrical principle, eliminating the old style weight tower mechanism, which is now considered obsolete. This new electrical principle also possesses the feature of being able to play the bells by hand, in the case of a full chime, obviating the old console method of hand bell-ringing. This may be employed to great advantage in church chimes as well. The Sheldon Building, San Francisco, will also be fully equipped, and we have the contract for equipping the new Marsh-Strong Building, Los Angeles, and the Los Angeles Times Building is also equipped with our secondary clocks, and we have the contract for equipping the new Hearst-Examiner Building in Los Angeles, and we have just been awarded the contract, by the State Engineering Department at Sacramento, for fully equipping the large Los Angeles State Normal School, consisting of ten buildings, and our system is already installed in the State Normal School at Santa Barbara. We have quite a large number of installations through the Sacramento Valley, including the D. O. Mills National Bank, Farmers' & Mechanics' Bank, Sacramento, and the Sacramento county court house, which has over 80 of our clocks. Also, in San Francisco, we have installed numerous equipments, a few of which are the Crocker National Bank, Shreve & Co.'s new factory, Olympic Club, Y. M. C. A. Building and the White House.

The business in Southern California is of such an encouraging nature that we have opened a direct branch office in the Marsh-Strong Building, Los Angeles, which is under the general office at San Francisco. Mr. O. A. Johnson is manager of the southern district, while Mr. J. McKean Fisher is taking care of our interests in the north, with an office in Portland, Ore. The works of the company are located at Springfield, Mass., and we have a branch in Boston, New York and Chicago.

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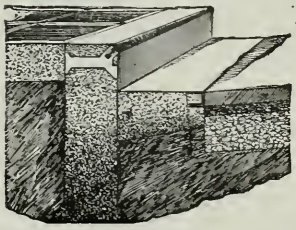

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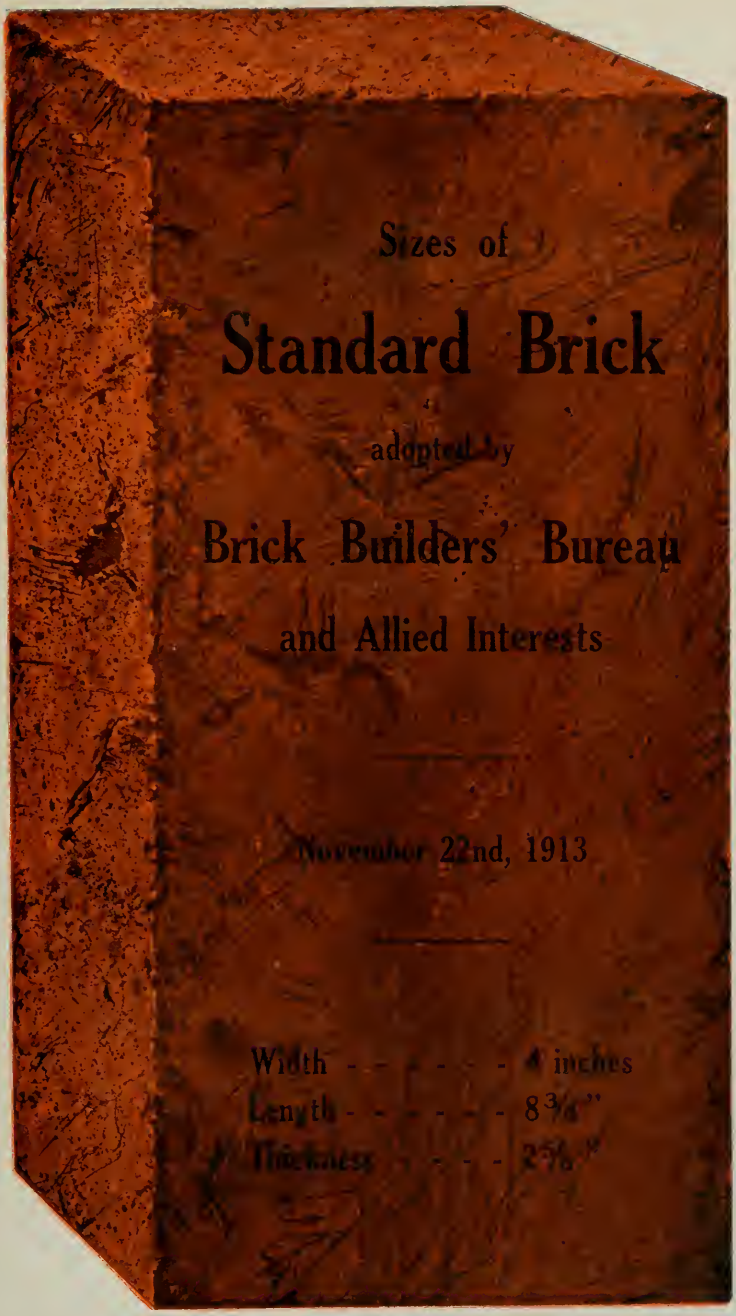
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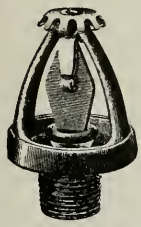

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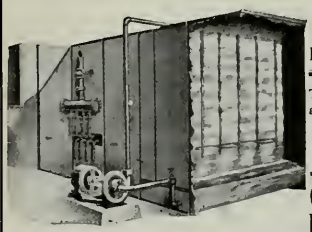

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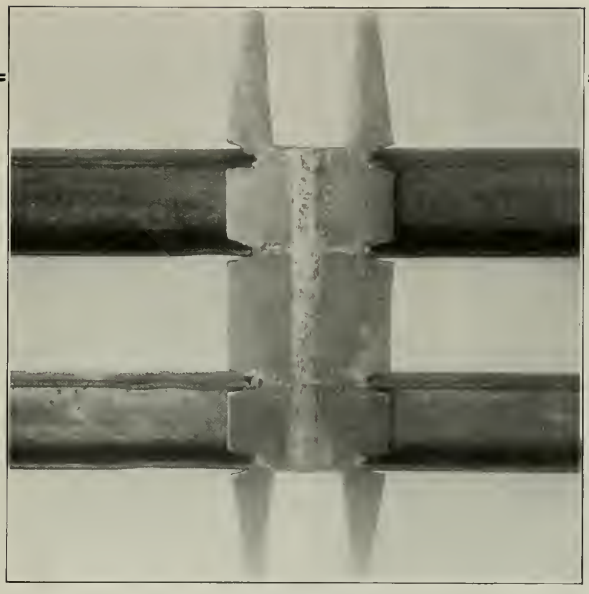

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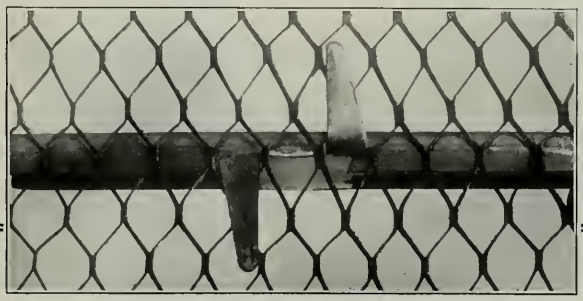

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The Solari Cafe

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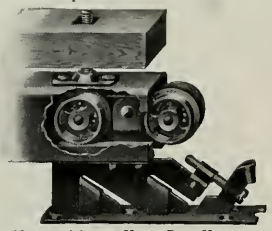

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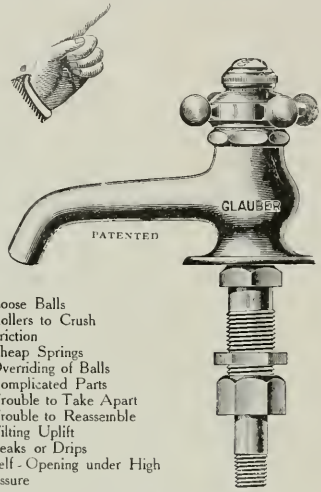

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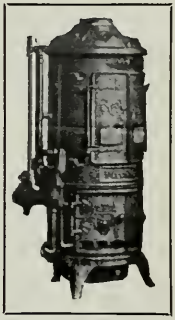

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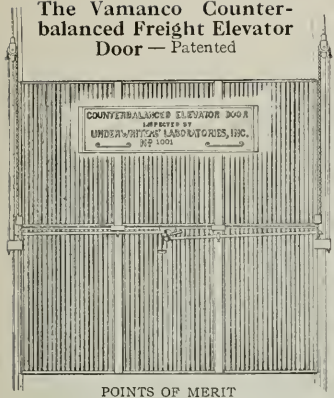

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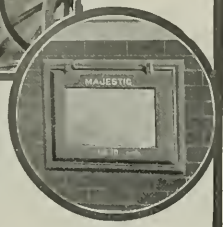

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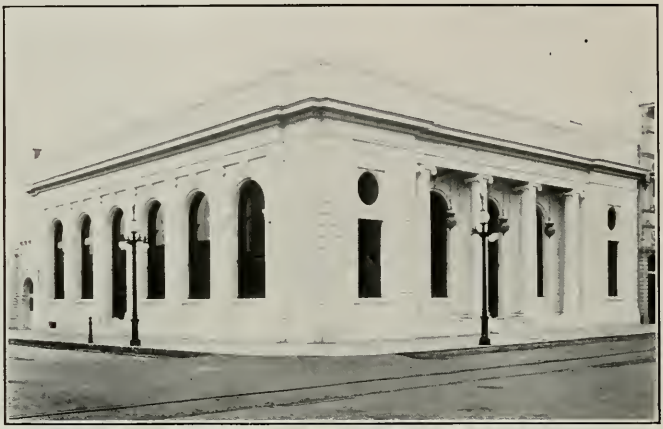

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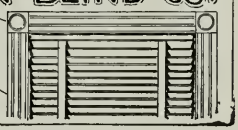

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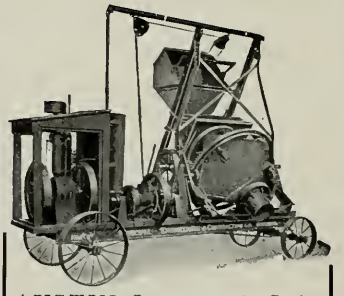

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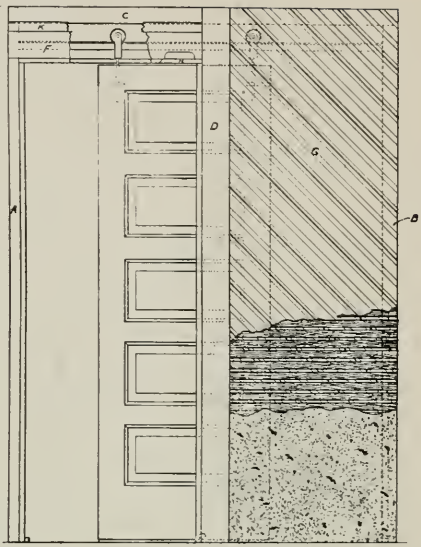

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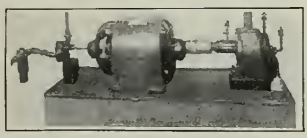

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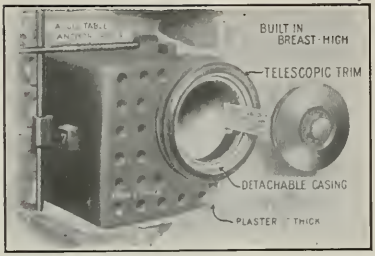

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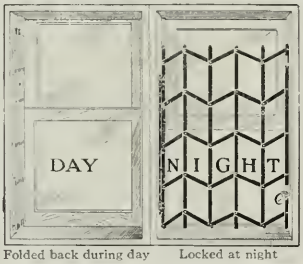

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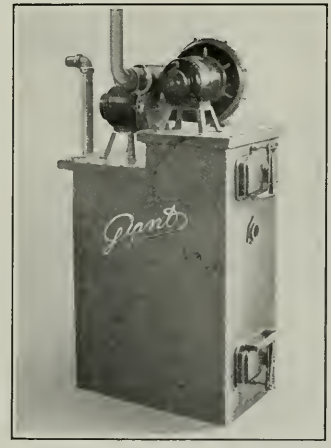

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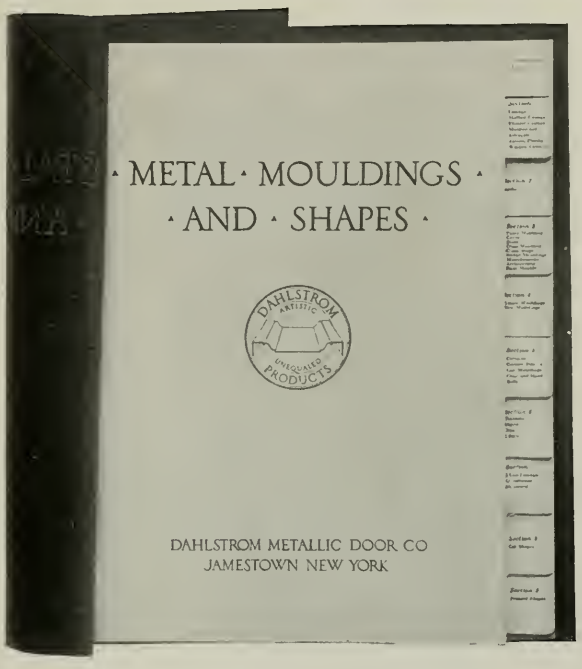

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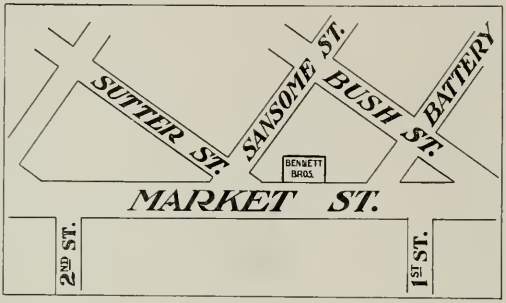

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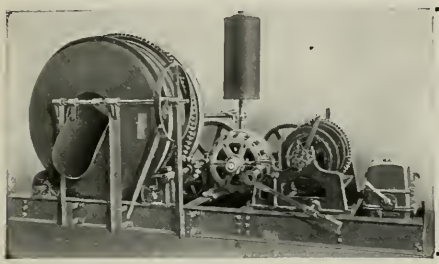

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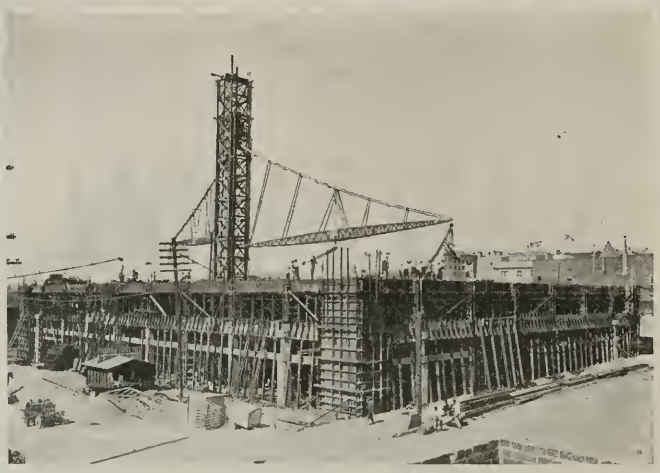

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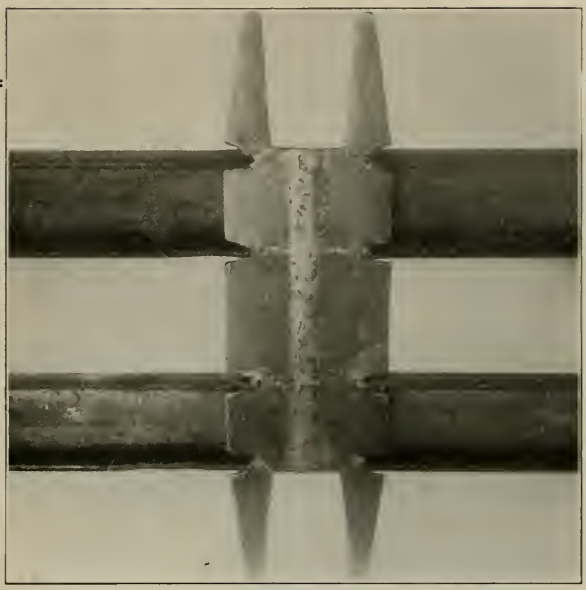

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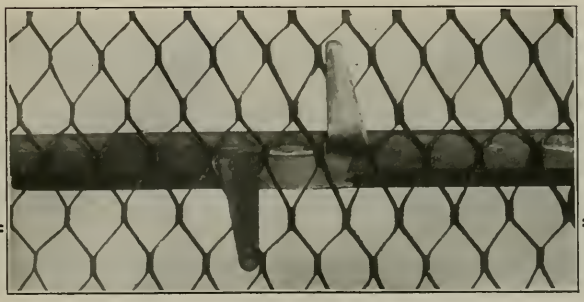

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ARCHITECTS' SPECIFICATION INDEX

(For Index to Advertisements, see next page)

AIR CLEANERS
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The Schoenfeld Marble Co., 265 Shipley St., S. F.
Western Sculptors....533-535 Turk St., S. F.

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Gladding, McBean & Company, Crocker Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.
N. Clark & Sons ....112 Natoma St., S. F.
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Van Dorn Iron Works Co....Cleveland, Ohio
A. J. Forbes & Son...1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co....365 Market St., S. F.
T. H. Meek Co.....1157 Mission St., S. F.
M. G. West Co.....353 Market St., S. F.
Home Mfg. Co.....543 Brannan St., S. F.
Weary & Alford Co., 1033 Van Nuys Bldg., Los Angeles

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Levensaler-Speir Corporation, Monadnock Building, S. F.
Massachusetts Bonding and Insurance Company.....First National Bank Bldg., S. F.
Pacific Coast Casualty Co., 416 Montgomery St., S. F.

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Diamond Brick Co.....Balboa Bldg., S. F.
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Golden Gate Brick Co..660 Market St., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Fire Brick Co....Livermore, Cal.
N. Clark & Sons.....112 Natoma St., S. F.
Pratt Building Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.
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American Paint & Dry Color Co., 414 Ninth St., S. F.
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An Index to the Advertisements

American Heat & Power Co.. 142
American Mason Safety Tread 153
American Paint Co. 26
American Revolving Door.... 129
American Rolling Mill Co.... 133
American Sheet & Tin Plate Co. 21
Ames-Irwin Co. 169
Amweg, Frederick J. 127
Angelus Hotel. 164
Armstrong Cork Co. 156
Ashlock Door Guard. 160
Atlantic Fireproofing Co. 130
Atlas Heating and Ventilating Co., Inc. 125
Atlas Portland Cement Co... 34

Bacon, Ed. R. 44
Barrett & Hilp. 162
Bay Development Co. 130
Beaudet, Geo. E. 149
Berger Mfg. Co., The. 167
Berry Bros. 4
Bill & Jacobsen. 162
Biturine Co. 44
Blaisdell Machinery Co. 35
Bluxome & Co. 149
Bosch, Hermann. 157
Bowser & Co., S. F. 145
Boxton, Geo. W. 171
Braun, J. G. 40
Breite, W. W. 122
Brick Builders' Bureau. 143
Briggs Bituminous Paint Co.. 30
Brode Iron Works. 11
Brown Hoisting Machinery Co. 18
Building Material Co., The, Inc. 6
Butte Engineering Co. 122
Burlington Venetian Blind Co. 153

C. Jorgenson & Co. 160
Cabot, Samuel (Inc.). 18
California Air Purifying Co... 167
Calif. Artistic Metal & Wire Co. 14
California Bldg. Material Co. Second Cover
Calif. Corrugated Culvert Co. 135
California Granite Co. 130
California Photo Engraving Co. 170
California Plumbing Supply Co. 43
California Sales & Supply Co.. 154
Calif. Safety Fireproof Co.... 22
Canton Manufacturing Co.... 19
Central Electric Co. 125
Central Iron Works. 41
Ceresit Waterproofing Co.... 3
Chowen, W. A.. 170
City Supply Co., Inc. 149
Clark-Ludwig. 159
Clark, N., & Sons. 29
Clinton Fireproofing Co. 150
Coleman, Alex. 127
Colonial Fireplace Co. 43
Columbia Marble Co. 10
Comyn, Mackall & Co. 28
Concrete Appliances Co. 2
Cook, H. N., Belting Co. 35
Cowell Lime & Cement Co.. 154
Crane Co. 43
Crosett & Eastman. 162
Cutler Mail Chute Co. 38

Dahlstrom Metallic Door Co.. 140
Davis-Rogers Co. 168
De Rome, Louis. 157
Diamond Brick Co. 28
Dieckmann Hardwood Co.... 123
Dixon, Joseph Co. 9
Douglas, John Co. 43
Dyer Bros. 39

Edwards, Burt E. 154
Elevator Supply and Repair Co. 136
Electric Agencies Co. 125
Engstrum, F. O. 169
Fess System. 170
Fibrestone and Roofing Co.... 11
Fidelity and Deposit Company of Maryland. 125
Finch, Chas. M. 154
Fink & Schindler Co., The.... 132
Fisher Tile Co. 170
Flagg, Edwin H., Scenic Co... 7
Florentine Art Studio. 130
Forbes, A. J. & Son. 157
Foster, Vogt Co. 138
Fuller, W. P., Co. 141
Giant Suction Cleaner Co.... 161
Gladding, McBean & Co.... 30
Glidden Varnish Co. 137
Globe Indemnity Co. 159
Goheen Mfg. Co. 17
Golden Gate Brick Co. 14
Golden Gate Structural and Ornamental Iron Works.... 16
Gordon Construction Co.... 166
Graham & Jensen. 171
Grant Gravel Co. 7

Hammond, M. E. 35–151
Hardwood Interior Co. 22
Harron, Rickard & McCone... 10
Haslett Co., The. 156
Hausmann, L. H. 162
Heath & Milligan. 144
Hercules Waterproofing Cem. Co. 135
Hill-Canton Dryer Co. 165
Hillard, C. J., Co. 42
Holmes Lime Co. 9
Home Heating Co. 122
Home Mfg. Co. 138
Howard, P. F. 162
Howard Clock Co. 145
Hughson & Donnolly. 138
Hunt, Robt. W. & Co. 129
Hunter & Hudson. 130

Independent Sewer Pipe & Terra Cotta Co. 159
Industrial Engineering Co.... 15
Insley Co. 25
Iroquois Iron Works. 42
Jarvis, J. P. 159
Jenkins Bros. 153
Judson Mfg. Co. 42

Kauffman Heating Co. 17
Kennedy, David. 133
Keyless Lock Co. 160
Kieffel & Esser. 2d Cover
Kimball, Sherman & Co., 162 and 17
Klenck, P. J. 171
Knowles, A. 160
Koehring Mixer. 37
Kohler, Company. 19
Krebs & Co. 157
Langford, Pelts & Meyers, 44, 162
Lathrop. 168
Lettich, A. 125
Levensaler-Spier Corp'n. 29
Lilley & Thurston. 3d Cover
Liquid Stone Cement Co. 31
Lithoid Products Co. 167
Livermore & Co., Norman B.. 169
Livermore Fire Brick Co. 30
Los Angeles Pressed Brick Co. 150
Lowrie Safe Co. 160
Lynch, A. 166

Mackenzie Roof Co. 127
Majestic Furnace Co. 151
Mangrum & Otter. 44
Marion Mfg. Co. 19
Mark-Lally Co. 154
Marsh-Capron Co. 36
Marshall & Stearns Co. 39
Maris Hardwood Co. 123
Massachusetts Bonding and Insurance Company. 130
McGraw, W. J. 168
McLeran & Peterson. 138
Meek, T. H. 136
Meese & Gottfried Co., Col. In. B
Moller & Schumann Co. 20
Monarch Iron Works. 138
Monson Bros. 171
Mortenson Construction Co... 132
Mosaic Tile Co. 170
Mott Iron Works. 149
Municipal Engineering Co.... 156
Muralo Co. 27
Murray, J. A. 157
Musto-Keenan Co. 12
Nason, R. N., & Co. 13
Nathan, Dohrmann Co. 127
National Lumber Co. 4
Nelson, N. O. 136
New York Belting & Packing Co., Ltd. 131
Niles Sand, Gravel & Rock Co. 28
Norris Co., L. A., Inside Front Cover
Olinger, A. M. 149
Otis Elevator Co. Back Cover
Pacific Coast Casualty Co.... 168
Pacific Fire Extinguisher Co.. 167
Pacific Gas & Electric Co.... 156
Pacific Hardware and Steel Co. 149
Pacific Imp. Co., Outside Back Cover
Pacific Rolling Mills. 41
Pacific Structural Iron Works. 171
Pacific Sewer Pipe Co. 30
Paraffine Paint Co. 143
Parcells & Cook. 182
Parrott & Co. 2–3–5
Parry Stone Co. 157
Patrick-Nelson Co. 159
Petersen, H. L. 171
Petersen-James Co. 122
Petrovffsky, John. 138
Phillips, Chas. T. 168
Pitcher Door Hanger. 4
Pittsburg Heater Co. 148
Pneulectric Co. 149
Portland Pile Co. 168
Pratt Building Material Co.... 121
Prometheus Electric Co. 35

Ralston Iron Works. 41
Ransome Concrete Co. 130
Reliance Ball-Bearing Door Hanger. 152
Richards-Wilcox Mfg. Co.... 152
Rickon, F. J. 159
Rodgers & Co. 151
Rodriguez Y Villa Co., A. 158
Roehling, Jno. A. 40
Rolandi, F. 149
Roman, C. 160
Rose, L. A. 168
Rudgear-Merle Co. 147
Russell & Erwin Mfg. Co. 33
Sac'mento Sandstone Brick Co. 40
Samson Cordage Works. 130
S. F. Metal Stamping and Corrugating Co. 151
S. F. Elevator Co. 162
S. F. Pioneer Varnish Works.. 23
Santa Fe Lumber Co. 165
Sarsi, O. S. 127
Sartorious & Co. 38
Schoenfeld Marble Co. 154
Schrader Iron Works. 170
Scott Co. 125
Scott, Walter. 157
Shreiber & Sons Co. 38
Silver Lake Sash Cord Co.... 138
Spencer Elevator Co. 13
Standard Co. 28
Standard Elec. Time Co., Insert A
Standard Oil Co. 24
Standard Port. Cement Corp. 26
Standard Varnish Works.... 22
Steel Protected Concrete Co.. 164
Steiger Terra Cotta & Pottery Works. 29 and 152
Stephenson, Edward. 154
Strable Manufacturing Co.... 165
Sunset Lumber Company.... 165
Taylor & Co. 138
Trost, Robert. 168
Totten & Brandt. 168
Tozer Company. 161
Trussed Concrete Steel Co.... 158
Tuec Co. 32
Turner, C. A. P. 15
Tyrrel, Horace W. 162
Union Hardware and Metal Co. 166
Union Metal Corner Co. 20
United Materials Co. 5
U. S. Metal Products Co.... 45
U. S. Steel Product Co. 155
Universal Safety Tread Co.... 42
Van Dorn Iron Co. 21
Van Emon Elevator Co. 4
A. R. Y. Villar Co. 168
Variety Mfg. Co. 151
Vonnegut Hardware Co. 23
Vulcan Iron Works. 38
Wadsworth, Howland & Co.. 31
Ward & Goodwin. 159
Watson Mantel & Tile Co.... 162
Weary & Alford Co. 149
Weber, C. P. & Co. 156
West Coast Wire & Iron Works 168
West, M. G. 130
Western Builders' Supply Co.. 37
Western Furnace Co. 125
Western Iron Works. 41
White Bros. 121
Williams Bros. & Henderson.. 169
Williams, H. S. 170
Wittman, Lyman & Co. 125
Woods & Huddart. 147
Zelinsky, D. 157

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- Bituruine Co. of America, 24 California St., S. F.
- Hercules Waterproofing, manufactured by Hercules Waterproofing Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
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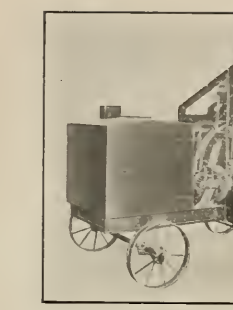

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"Kahn System," see advertisement on page 172 this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., S. F.
Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating, sold by R. N. Nason & Co., San Francisco and Los Angeles.
Liquid Stone Paint Co., Hearst Bldg., S. F.
"Concreta," sold by W. P. Fuller & Co., S. F.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
Moller & Schumann...1023 Mission St., S. F.

CONTRACTORS, GENERAL
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Foster, Vogt Co.....Sharon Bldg., S. F.
F. Reland.....Bank of Italy Bldg., S. F.
Geo. W. Boxton.....Hearst Bldg., S. F.
McLaren & Peterson.....Sharon Bldg., S. F.
Howard S. Williams.....Hearst Bldg., S. F.
Graham & Jensen.....Maskey Bldg., S. F.
Ransome Concrete Co., 1218 Broad'y, Oakland
F. J. Rickon, C. E., 1859 Geary St., S. F.
Robert Trost....26th and Howard Sts., S. F.
Williams Bros. & Henderson, Holbrook Bldg., S. F
Burt T. Owsley...311 Sharon Bldg., S. F
L. A. Rose.....Monadnock Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal
Ward & Goodwin.....Sharon Bldg., S. F

CORK TILING
David J. E. Kennedy, Inc. Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., S. F.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Goheen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing, manufactured by Hercules Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Lithoid Product Company, Merchants Exchange Bldg., S. F.
Trus-Con Damp proofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F.
Liquid Stone Paint Co....Hearst Bldg., S. F.
Standard Co.....268 Market St., S. F.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.
Richards-Wilcox Mfg. Co.....Aurora, Ill.

CALIFORNIA MARBLE

Seven Different Grades—Superior Finish—Moderate Price
Used in the New San Francisco Hall of Justice, Merchants Exchange Building Alaska Commercial Building, and others.

COLUMBIA MARBLE COMPANY
268 MARKET STREET, Rooms 201-202 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., S. F.
Excelsior Dumb Waiters, manufactured by R. M. Rodgers Co., Brooklyn; M. E. Hammond, 217 Humboldt Bank Bldg., S. F.
Burdett-Rowntree Mfg. Co., Underwood Bldg., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., S. F.

ELEVATORS
Otis Elevator Company, Stockton and North Point, S. F.
Spencer Elevator Company, 126 Beale St., S. F.
S. F. Elevator Co.....860 Folsom St., S. F.
Van Emon Elevator Company, Natoma St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., Underwood Bldg., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
Crosett & Eastman.....Hearst Bldg., S. F.
L. M. Hansmann.....Sharon Bldg., S. F.
Hunter & Hudson.....Rialto Bldg., S. F.

EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices mfrd. by Vonnegut Hardware Co. (See adv. for Coast Distributors).

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., Underwood Bldg., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vonnegut Hardware Co. (See adv. for Coast Agencies).

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, 13435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Scott Company.....243 Minna St., S. F.
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.

FIRE EXTINGUISHERS—Continued
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., 687 Market St., S. F.
Gladding, McBean & Co., Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., L. A.
The Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors, Monadnock Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.
California Safety Fireproofing Company, 687 Market St., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Company, 1157 Mission St., S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Moller & Schumann Co., 1022 Mission St., S. F.

FLOORS—CORK
Nonpareil Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., S. F.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit,
Bowser & Co. .....612 Howard St., S. F.

GARBAGE CHUTES
Bill & Jacobsen.....Rialto Bldg., S. F.

GRANITE
California Granite Co., 776 Monadnock Bldg., S. F.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
Niles Sand, Rock & Gravel Co., 971 Howard St., S. F.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co.....S. F.
American Keen Cement Co, Levensaler-Spier Corporation, Representatives, Monadnock Bldg., S. F.

HARDWARE
Richards-Wilcox Mfg. Co.....Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.

W. R. BRODE, Pres. R. J. BRODE, Secretary Telephone Kearny 2464

BRODE IRON WORKS

ESTABLISHED 1886 — INCORPORATED 1913

Manufacturers of Structural Steel and Ornamental Iron Work

Office and Works: 31-37 Hawthorne St., bet. Howard and Folsom Sts., SAN FRANCISCO, CAL.

CLARENCE E. MUSTO, Pres. JOSEPH B. KEENAN, Vice-Pres. GUIDO J. MUSTO, Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— **MARBLE** OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD FLOORING
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

HARDWOOD LUMBER
Dieckmann Hardwood Co., Beach and Taylor Sts., S. F.
Parrott & Co.....320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co., First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 237 Powell St., S. F.

LOCKERS
Keyless Lock Co.....Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
Edward Stephenson..155 Fremont St., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co., Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F.
A. Letticb.....365 Fell St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Scott Company.....243 Minna St., S. F.
Pacific Blower & Heating Co., 17th St., bet. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOSE RACKS AND REELS
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

HOTELS
The Angelus, Loomis Bros.....Los Angeles

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co., 5th and Parker Sts., West Berkeley.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., S. F.

INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.

INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co., 155 New Montgomery St., S. F.

LIME
Holmes Lime Company, Monadnock Bldg., S. F.
Henry Cowell Lime & Cement Co., 9 Main St., S. F.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So. .....Oakland, Cal.
Santa Fe Lumber Co., Seventeenth and De Haro Sts., S. F.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (see adv. on page 38 for Coast representatives).

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co., Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.
Joseph Musto Sons-Keenan Co., 535 North Point St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co., Pacific Bldg., S. F.
Jackson Fireproof Partition Co., Levensaler-Spier Corporation, Distributors, Monadnock Bldg., S. F.
John Roebling Sons Co., Folsom St., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
Pratt Building Material Co., Hearst Bldg., S. F.

METAL CEILINGS
Berger Mfg. Co.....1120 Mission St., S. F.
Ames-Irwin Co., Inc., Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.
Canton Mfg. Co., Sherman Kimball & Co., First and Howard Sts., S. F.

METAL FURNITURE
M. G. West Co..... 353 Market St., S. F.
The Keyless Lock Co.....Indianapolis, Ind.
Van Dorn Iron Works Co.....Cleveland, O.
Chas. M. Finch, 311 Board of Trade Bldg., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co.....2269 Folsom St., S. F.

OIL BURNERS
American Heat & Power Co., Seventh and Cedar Sts., Oakland
Fess System Co.....220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co., 349 Seventh St., S. F.
I. G. Braun.....Chicago and New York
Ralston Iron Works, 20th and Indiana Sts., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., S. F.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.
Vulcan Iron Works.....S. F.

PAINTING AND DECORATING
D. Zelinsky.....564 Eddy St., S. F.
C. H. Krebs & Co.....Sacramento, Cal.
Horace W. Tyrrel, 1707 38th ave., Oakland.

PAINT FOR BRIDGES
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Briggs Bituminous Corporation Co., J. & R. Wilson, agents.....117 Steuart St., S. F.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Joseph Dixon Crucible Co., Coast branch, 155 Second St., S. F.
Trus-Con Bar-Ox. Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

SPENCER ELEVATOR COMPANY
(FORMERLY WELLS AND SPENCER MACHINE CO.)
126-128 BEALE STREET
TELEPHONE KEARNY 664 SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

PAINT FOR CEMENT

American Paint & Dry Color Co., 414 Ninth St., S. F.

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), (see adv. in this issue for Pacific Coast agents.)

"Biturine," sold by Biturine Co. of America, 24 California St., S. F.

California Safety Fireproofing Company, 687 Market St., S. F.

Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.

Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego

Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

Moller & Schumann Co., West Coast Branch, 1022 Mission St., S. F.

Concreto Cement Coating manufactured by the Muralo company. (See color insert for Coast distributors.)

Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

Goheen Mfrg. Co., ...Canton, O
See advertisement for Coast distributors

PAINTS, OILS, ETC.

American Paint & Dry Color Co., 414 Ninth St., S. F.

Concreto Cement Coating, manufactured by the Muralo company. (See color insert for Coast distributors.)

Bass-Huetter Paint Company, Mission, near Fourth St., S. F.

"Biturine," sold by Biturine Co. of America, 24 California St., S. F.

Goheen Mfrg. Co., ...Canton, O.
See advertisement for Coast distributors

Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles

Standard Co.....268 Market St., S. F.

Moller & Schumann Co., 1022 Mission St., S. F.

Berry Bros.....250 First St., S. F.

Paraffine Paint Co....38-40 First St., S. F.

R. N. Nason Company.....San Francisco

Standard Varnish Works.....113 Front St., S. F.

PHOTO ENGRAVING

California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRAPHY

R. J. Waters Co.....717 Market St., S. F.

Walter Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON

California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.

N. Clark & Sons, 112 Natoma St., San Francisco

Gladding McBean & Co., Crocker Bldg., S. F.

Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles

Pratt Bldg. Material Co., Hearst Bldg., S. F.

Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD

Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation.....259 Monadnock Bldg., S. F.

"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS

Geo. MacGruer....319 Mississippi St., S. F

Herman Bosch.....4420 20th St., S. F.

A. Knowles.....985 Folsom St., S. F.

W. J. McGraw....1636 Felton St., Berkeley

PLUMBING

Scott Company.....243 Minna St., S. F.

Peterson-James Co.....710 Larkin St., S. F

Wittman, Lyman & Co., 340 Minna St., S. F.

Alex Coleman.....706 Ellis St., S. F.

Antone Ettich.....365 Fell St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.

Crane Co., Second and Brannan Sts., S. F.

Ino. Douglas Co....571 Mission St., S. F.

N. O. Nelson Mfg. Co., 978 Howard St., S. F.

Kohler Co.....1001 Monadnock Bldg., S. F.

California Steam Plumbing Supply Co., 671 Fifth St., S. F.

Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.

Mark-Lally Co., First and Folsom Sts., S. F.

J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.

POTTERY

Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PULLEYS, SHAFTING, GEARS, ETC.

Meese and Gottfried Company.....San Francisco, Seattle, Portland and Los Angeles

RADIATORS

Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

ROAD MACHINERY

Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.

Langford, Felts & Myers..Rialto Bldg., S. F.

REFRIGERATORS

McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton. Sts., S. F

Vulcan Iron Works.....S. F.

Specify **OPAQUE FLAT FINISH**
A High Class WASHABLE PAINT for Inside WALLS.
Less material required to cover more surface than any other similar Product.
R. N. NASON & CO. Oil and Paint Makers
151-161 Potrero Avenue — SAN FRANCISCO — 54-56 Pine Street

50 KINDS OF BUILDING MATERIALS
GOLDEN GATE BRICK CO.
660 MARKET ST. (opp. Palace Hotel) San Francisco. Phone Kearny 3378

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REVOLVING DOORS
American Revolving Door Co.,
2514 Monroe St., Chicago, Ill.
Van Kennel doors, sold by U. S. Metal Products Co.....525 Market St., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F
Wilson's Steel Rolling Doors. U. S. Metal Products Co.,
San Francisco and Los Angeles

ROOFING AND ROOFING MATERIALS
Ames-Irwin Co., Inc.,
Eighth & Irwin Sts., S. F.
Biturine Co. of America,
24 California St., S. F.
Golden Gate Brick Co..660 Market St., S. F.
Grant Gravel Co.....Williams Bldg., S. F.
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy,
Monadnock Bldg., S. F.
Fibrestone & Roofing Co.,
971 Howard St., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
Mackenzie Roof Co., 425 15th St., Oakland.
United Materials Co.... Balboa Bldg., S. F.

ROOFING TIN
American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.

RUBBER TILING AND MATTING
New York Belting & Packing Co.,
129 First St., S. F.

SAFES, VAULTS, BANK EQUIPMENT
M. G. West Co.....353 Market St., S. F.
Parcells & Cook.....425 Sharon Bldg., S. F.

SAFETY TREADS
Universal Safety Tread Co., represented by Waterhouse and Price, San Francisco and Oakland.
American Mason Safety Tread—See advertisement on page 131 for Coast Agents.

SANDSTONE BRICK
Sacramento Sandstone Brick Co.,
Sacramento, Cal.
Golden Gate Brick Co..660 Market St., S. F.

SANITARY DRINKING FOUNTAINS
N. O. Nelson Mfg. Co.,
978 Howard St., S. F.
Kohler Co.....Monadnock Bldg., S. F.

SASH CORD
Florian Sash Cord Company. (For Coast Agents, see advertisement.
Samson Cordage Works. Manufacturers of Solid Braided Cords and Cotton Twines
88 Broad St., Boston, Mass.
Silver Lake A Sash Cord, represented by Sanford Plummer,
149 New Montgomery St., S. F.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Company,
1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co....365 Market St., S. F.
512 S. Broadway, Los Angeles.

SCREENS
J. A. Murray, sales agent for the Higgin All Metal Window Screen.
805 Monadnock Bldg., S. F.

SCULPTORS
Western Sculptors, 533-535 Turk St., S. F.

SHEATHING AND SOUND DEADENING
Neponset Waterproof Building Papers, Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK, SKYLIGHTS, ETC.
Berger Mfg. Co.....1120 Mission St., S. F.
Capitol Sheet Metal Works,
1927 Market St., S. F.
Western Furnace & Cornice Co.,
1645 Howard St., S. F.
U. S. Metal Products Co.,
525 Market St., S. F.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

SPIRAL CHUTE
The Haslett Spiral Chute Co.,
310 California St., S. F.

STEEL AND IRON—STRUCTURAL
Central Iron Works..621 Florida St., S. F.
Dyer Bros.....17th and Kansas Sts., S. F.
Judson Manufacturing Company,
819 Folsom Street, San Francisco.
Brode Iron Works,..31 Hawthorne St., S. F.
Mortenson Construction Co.,
19th and Indiana Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, Agt.,
135 Kearny St., S. F.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK - President
ORNAMENTAL IRON & BRONZE WORK
349-365 SEVENTH ST. SAN FRANCISCO.
TELEPHONE: MARKET 2162

Turner Mushroom System

of Concrete Construction for Buildings and Bridges

A LOS ANGELES TEST

During the early part of November, the the large Ford Motor Car Service Building, Los Angeles, was tested. The test panel 28x26 feet was loaded to double the design load over the full area. Total load 190 tons or 300 lbs. per square foot. The maximum deflection was 3/8″ or about 1/900 of the span.

This building is five stories and basement, reinforced concrete throughout, covering a ground area 135′x 200′ and containing the largest panels of any building in Los Angeles.

Parkinson & Bergstrom, Architects, Los Angeles.

C. Leonardt, Contractor, Los Angeles.

E. T. Flaherty, Representative, Mushroom System, Los Angeles, Cal.

C. A. P. TURNER
Phoenix Bldg., MINNEAPOLIS, MINN.

Pacific Coast Representatives
INDUSTRIAL ENGINEERING CO.
Clunie Building, San Francisco
E. T. FLAHERTY,
I. W. Hellman Building, Los Angeles
A. P. HUECKEL,
Vancouver Building, Vancouver, B. C.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL AND IRON—STRUCTURAL—Cont'd.
Pacific Rolling Mills,
17th and Mississippi Sts., S. F.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, Etc. Phone Market 1374; Home, J 3435. 370-84 Tenth St., S. F.
Ralston Iron Works,
Twentieth and Indiana Sts., S. F.
Schrader Iron Works .....San Francisco
U. S. Steel Products Company,
Rialto Bldg., S. F.
Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Vulcan Iron Works.....San Francisco
Western Iron Works....141 Beale St., S. F.
Woods & Huddart ...444 Market St., S. F.

STEEL BARS FOR CONCRETE REINFORCEMENT
Judson Manufacturing Company,
819 Folsom Street, San Francisco
Kahn and Rib Bars, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Woods & Huddart....444 Market St., S. F.

STEEL DOORS AND TRIM
Dahlstrom Metallic Door Co.,
353 Market St., S. F.

STEEL DOOR GUARDS
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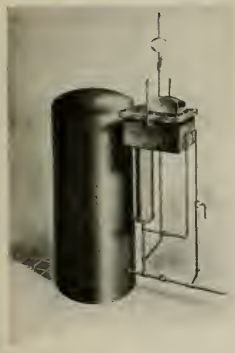

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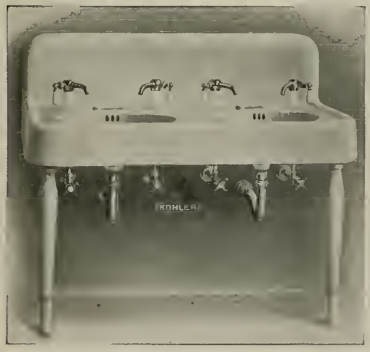

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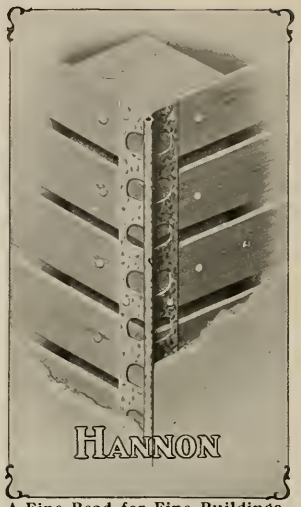

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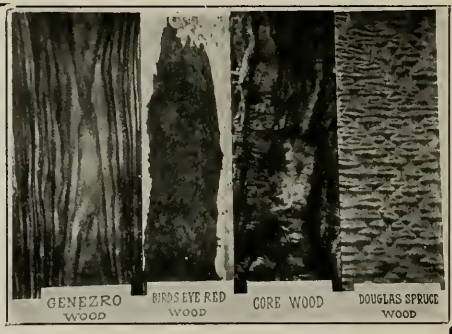

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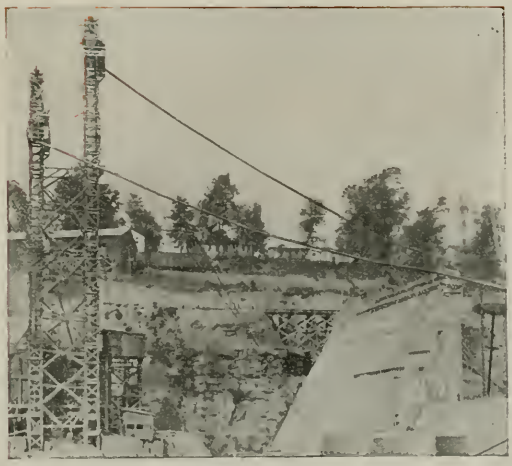

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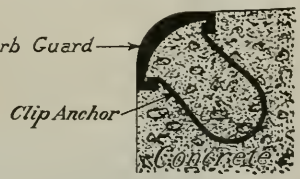

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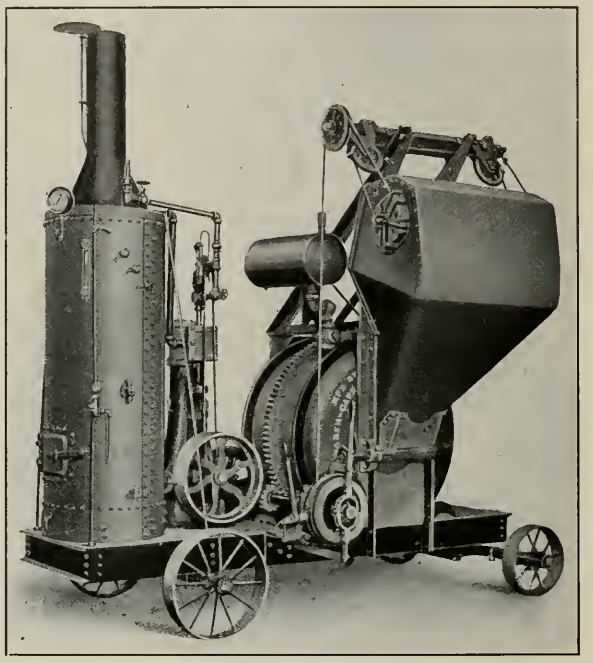

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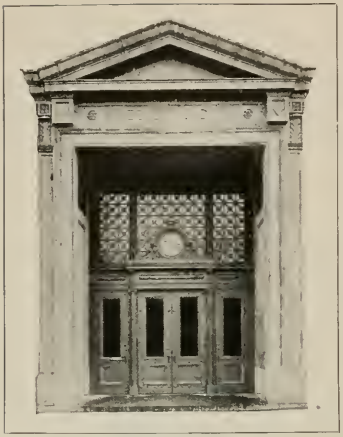

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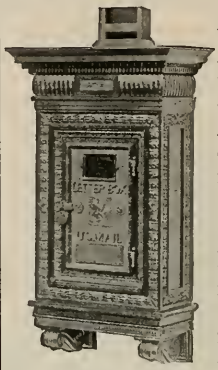

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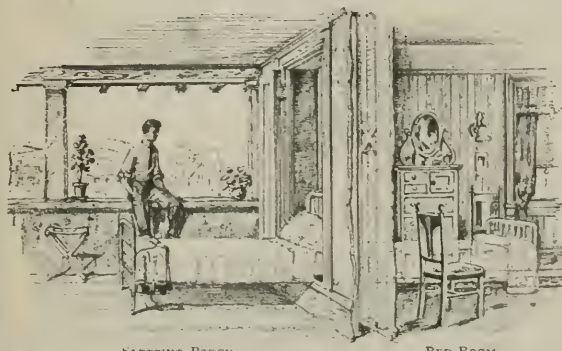

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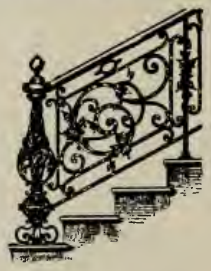

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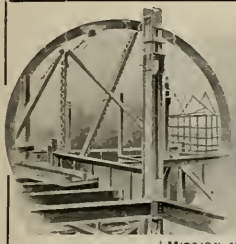

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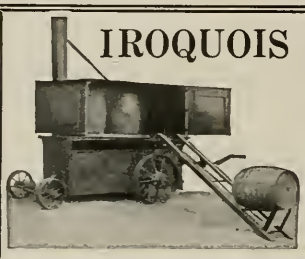

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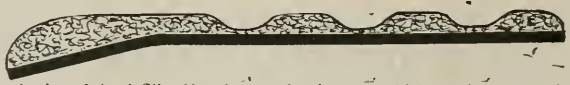

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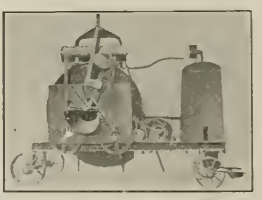

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Contents for January

	PAGE
Detail Entrance to Masonic Temple, San Francisco	*Frontispiece*
The Work of Bliss & Faville, Architects	47
B. J. S. Cahill	
Forecast of 1914 Building Record	A
Who's Who in Pacific Coast Architecture	93
II—Clarence Richard Ward	
Developing a New Style—A Rebel in the Camp of Architects	95
Abstract of an Essay on Flats	97
Illumination	98
Charles T. Phillips, C. E.	
Architects' Competition for $350,000 Fountain	105
The Value of Paint for Structural Steel	106
A. H. Sabin	
A Successful Architectural Competition	109
Local Materials and Labor in Connection with Federal Work	110
Among the Architects	111
Editorial	114
State, County and Municipal Engineering	116
Heating and Lighting	119
By the Way	126

(Index to Advertisements, page 8)

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Frontispiece
The Architect and Engineer
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January, 1914

THE
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VOL XXXV NUMBER 3

THE WORK OF BLISS & FAVILLE

BY B·J·S·CAHILL

I

HOWEVER much a life of storm and stress may mellow the work of the painter, the composer or the poet, it is doubtful whether a checkered career has ever reacted favorably on the output of an architect. The reason is quite obvious. Architecture is itself born of material success. More essential to the creation of the Acropolis were the spoils of the Persians than the genius of Pericles. A gigantic accumulation of Peter's pence built the biggest of all Christian churches, just as the people's pennies of the United States have builded Mr. Woolworth's most monstrous of skyscrapers. Money in large quantities is the first essential to all building operations, no matter where nor how derived: by confiscation, contribution, or plain business competition. In this sense the effective architect must have buildings to build. A struggling architect is something of an anomaly, like a struggling banker. To reverse the argument, does it not sound odd to speak of a successful clergyman? A priest's business is to pray and preach—not to prosper. Now, as there is something wrong about the notion of a prosperous priest, so there is something a little wrong, too, about a struggling architect. Success achieved by strife in an architect's career is too often gained at a price that no rightly constituted man will pay. Better frank failure through lack of patrons than a feverish and frantic victory at the expense of ethics, fair play and decency.

The career of Bliss & Faville is particularly free from sordid and undignified strife. From first to last fortune has favored them as the

gods favored the heroes of antiquity. And there is that in Greek art and ethics which disapproves all victories that are not easy, all conquests that are not calm. Moreover, the demands of the profession are exacting. They call for sound judgment, a sane view of life, untortured with strife and care, and a liberal and continual supply of commissions. Nothing can be done well unless it is done abundantly and done often. A large output is essential to a good output. Yet, on the other hand, the output should not be too large so that, as in some cases, the architect is merely an administrator of a huge plan factory, rather than a creator, a developer and an artist. These felicitous conditions have attended the career of Bliss & Faville, the architects, from the start, with results that have brought credit to the status of architecture on the Pacific Coast, as well as inspiration to their brethren and pleasure to the public, who enjoy the many-sided benefits conferred by well-arranged and beautiful buildings.

* * * * * * * *

II

The series of buildings here illustrated are shown more or less in the proper sequence of their design and construction. They group themselves into the usual three periods that are almost inevitable in any sequence of creative work. First one detects the influence of school training and the traditions of the foster firm or master, or patron, as the French would say, where apprenticeship was served. Of course this first period includes the enthusiasm for the antique, which is usually the first obsession of the young architect who is worth his salt. In this class one easily places the two bank buildings, the Oakland Library and the McNear residence. Three of these are studies in pure classic, and three of them are distinctly reminiscent of similar work done by McKim, Mead & White, the distinguished trio in whose office this firm learned its craft and acquired its initial inspiration.

The second period of a creative career is usually a departure from this first impetus on formal academic lines towards something freer. It often includes essays into various different styles. In this period one should place the St. Francis Hotel, the Prescott School, the Diocesan House and the Columbia Theater. In the Balboa Building and the University Club there are signs that the architects' ideas are becom-

ing fixed along definite lines that are distinctly Italian. Something of the formality of the first period still remains, but there are signs that texture, surface and material will be considered in place of abstract form; that feeling and variety will supplant logic and symmetry hereafter as the guiding principles of design.

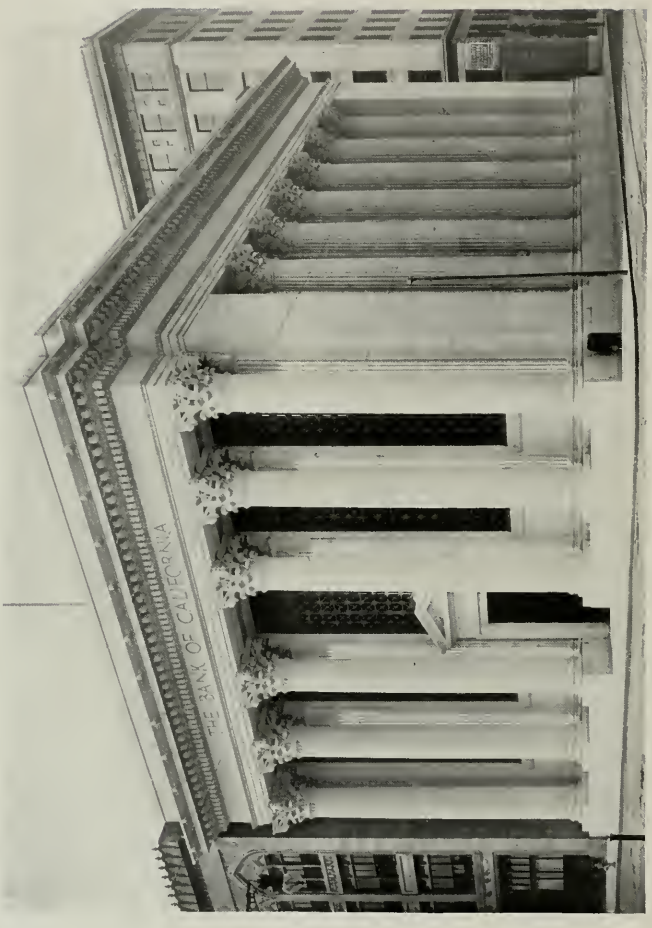
The final period is marked by the definite adoption of what, for want of a better term, I will call the early Italian manner as distinguished from the later Roman or more local Venetian. The definition is loose and perhaps it might be more illuminating if one added that it is a style in which materials of the cheaper kind such as brick and terra cotta are wrought into forms of unexpected elegance—where considerations of color and texture give new charm to old motives and where by the magic of the builder's craft inert masses of material take on a new glamor of poetry and romance. Perhaps it is the first appearance of the picturesque in architecture. Perhaps it is a sort of democratic development by which the designer's efforts are broadened and the spirit of architecture is made to dwell in common clay as well as in cut stone and costly marble.

In this third manner are to be placed such structures as the Oakland Hotel, the Children's Hospital, the London and Liverpool and Globe Building and the new Masonic Temple. An excursion into the fascinating realms of Spanish Renaissance as seen in the Exposition walls affords an agreeable interlude to an otherwise very consistent and persistent program.

III

The Oakland Library, looked upon as an architectural organism, belongs to the same family as the famed one in Paris and its first cousin in Boston. This is a distinct merit. If the problem is the same the solution should also be similar. This building was won in a competition. The writer well remembers how unchallenged was this award, although in a sense the program, as in so many other instances, was conceived with far less intelligence than the solution. In other words, while most of the other competitors were racking their brains to arrange a lot of rooms according to instructions, the architects of the winning plan conceived the whole as one large room occupying the entire floor, the divisions needed in a library being worked out with low partitions and screen walls after the manner of a bank. The clean simplicity of the whole scheme is quite admirable. The cost is kept down by a sensible reiteration of motives, both large and small, and a severe though not uninteresting squareness of outline.

The Prescott School is a vindication of a theory long entertained by the writer that Tudor or Collegiate Gothic done in brick and stone is the correct style for educational buildings of all kinds. It allows massed and mullioned windows, it permits the more expensive accumulations of stone work to be concentrated at points of importance in a way less easy in classic, and finally it lends itself to honest and frank use of brick for the rear walls, sides and courts in such a way that, if handled with skill, leaves a sense of a complete design from play ground as well as street front. It is hard to imagine the bad effect on young and tender minds of the shoddy and makeshift expedients of architect and school board trying to build a "classic" school house on one-quarter of the funds really needed. This putting up of a false front is of course the basis of all that is mean and vulgar in life. Yet most of our schools are built on these principles. A glance at the picture shows how much more charm and interest can be got out of a Tudor tower in



BANK OF CALIFORNIA
SAN FRANCISCO

honest material than out of a bald portico of uncouth columns supporting a cornice of buckling copper or sanded sheet metal.

The Diocesan House, in similar style, has the fascination of the infrequent, but where this sort of work is done often this example would appear a little too stiffly symmetrical and a little heavy in its traceries.

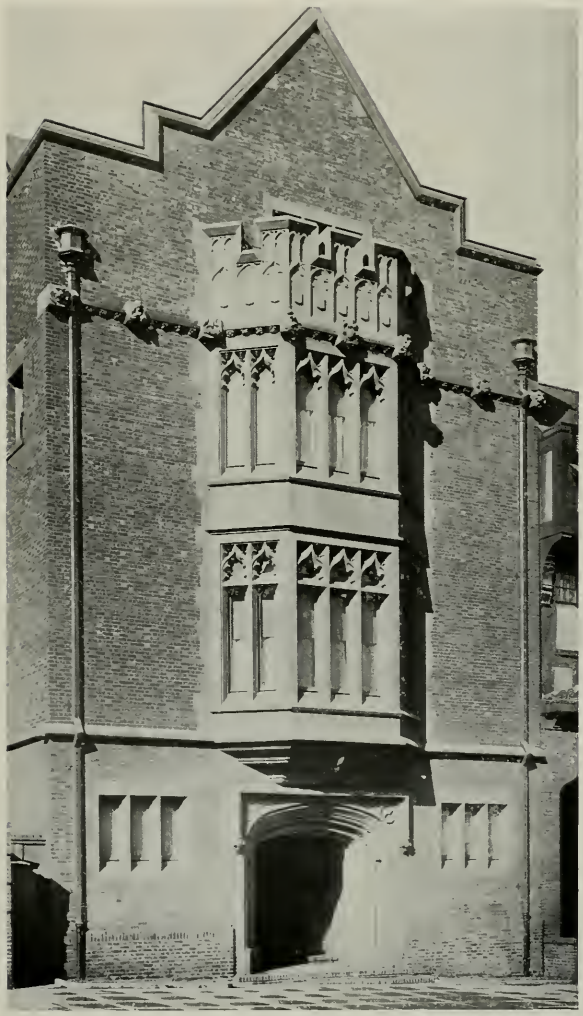
The Bank of California, as seen from the outside, is a good example of classic work rightly done because sumptuously done, which the near-classic of a cheap school house never possibly can be. It is a fine sample of a Corinthian colonnade and pitched in such a scale as to really suggest the boldness and the splendor of ancient Rome. No doubt it is a fine thing to have in every metropolis at least one example of each of the orders to remind us of the tremendous dignity of the antique, lest we accept the silly philosophy of the street which believes the latest thing is the best thing.

It is rather an unfortunate fact that the plots of ground upon which many of our banks are built are of unsatisfactory proportions. This building would be far more pleasing were it either longer or narrower. The widening of the central intercolumnar space is somewhat disturbing to the fastidious eye, and the perfectly blank pylons flanking the sides seem abrupt and unfinished. Both these blemishes might possibly have been neutralized by making the side columns align with the corner front column, which should be drawn out to the side of the lot. Two columns added to the Sansome street row would just carry the series to the corner pilaster. This would have given an appearance of greater length where greater length was needed. On the other hand, it must not be forgotten that a very useful elevator to the directors' room is carried in the granite shell of what appears to be a thick and solid corner.

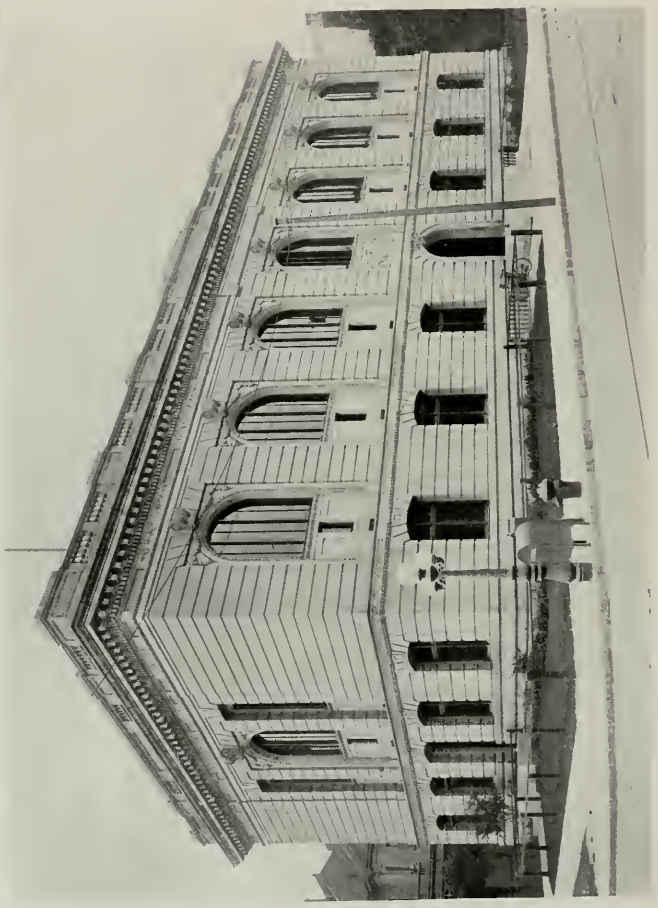
The interior has the lift and spaciousness of a Roman Basilica, but the undecided proportion is an adverse condition, and Tennessee marble in large masses creates an austerity of tone that is not quite comfortable. Otherwise the banking room carries an air of great dignity.

An unfortunate feature of this interior, and indeed of other interiors, such as the Savings Union and the London and Liverpool and Globe, consists of lack of consideration given to what, for want of a better term, I will call the "outlook." Of what avail is it to design with conscientious care the four walls, the ceiling and the floor of any monumental chamber with painstaking attention to scale, color and lighting so that perfect harmony shall unite all parts in one consistent effect? Of what use is this accumulation of effort if the whole is finally to be marred by the intrusion of the commonplace and discordant details of the surrounding streets or the back walls, bill boards and smoke stacks of the average alley? Let the reader, if he be an architect, consider that he has before him a section through a large banking room. The windows are high and big, and in the gray detail of the wall design they stand out magnificently as bold, white, rhythmic forms. The effect on paper is lovely, especially if the pilasters and surfaces in between are tinted in crayon or skilfully toned. Now let your draftsman fill in these ghostly silhouettes of unsullied white with the brutal brickwork, iron shutters, crooked gutters and what-not of the old buildings across the court. These things are actually there and will be seen to the utter discomfiture of all your designing and the spoiling of the most carefully considered harmony you can ever evolve. Even if the exterior features are not hideous, they are almost certain to be quite out of scale, and the bigger the windows and larger the room the more disturbing is the effect.

PRESCOTT SCHOOL
OAKLAND, CALIFORNIA



DIOCESAN HOUSE FOR THE EPISCOPAL
BISHOP OF CALIFORNIA
SAN FRANCISCO



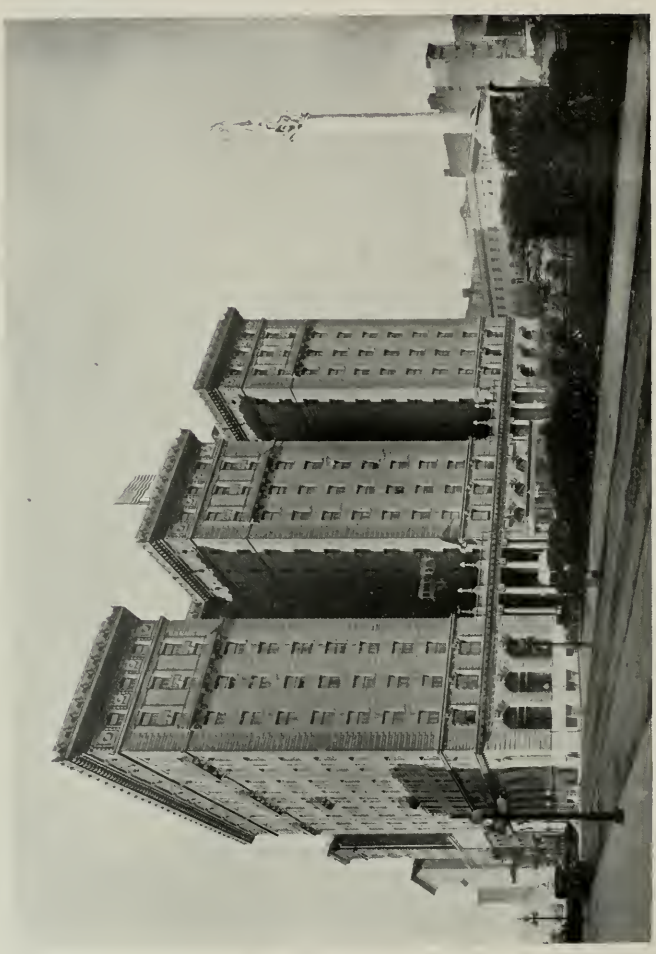
OAKLAND PUBLIC LIBRARY BUILDING
OAKLAND, CALIFORNIA

TAHOE TAVERN
LAKE TAHOE, CALIFORNIA

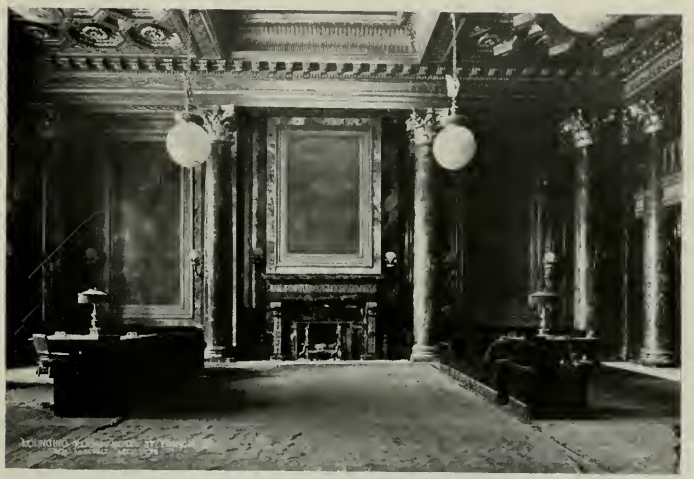
Far better than screening the windows with the hackneyed and rather unreasonable Roman grille (the draftman's delight, I know), would it be to use translucent glass—chipped, blurred, ribbed, mottled, it is all one. This device would let in the light and without offense to the sight. I have often been surprised to find architects so little sensitive on this point.

The Hotel St. Francis furnishes a very pretty problem in its exterior design. Here we have a complete facade of three pavilions and two intervening courts. To this, by the merest chance, and because at the outset such a possibility was unexpected, must be added another wing, but there is no room for another court. What is to be done? The problem is, like squaring the circle, quite insoluble. A dominating tower say some. My suggestion, since the original building is dark Colusa stone, would be an apparently separate building of palest terra cotta, but this would not suit the owners, who obviously wish to let the growing business of the hotel announce itself to the world at large. Probably, after all, the architects have wisely cut this Gordian knot instead of trying to untie it. They have simply widened the end pavilion until it reached the corner, and let it go at that.

The interior is full of interest architecturally. There is an effect created of sumptuousness and crowdedness which gives that bewildering sense of the pulse and passion of life at high pressure in a great metropolis. Nor is this achieved by any trick the least bit vulgar or garish. The original tea room, which has recently been changed to a dining room, was a harmony in Antwerp blue tapestry and gray stonework unsurpassed in its effect by any hotel interior in the country.



HOTEL ST. FRANCIS
SAN FRANCISCO

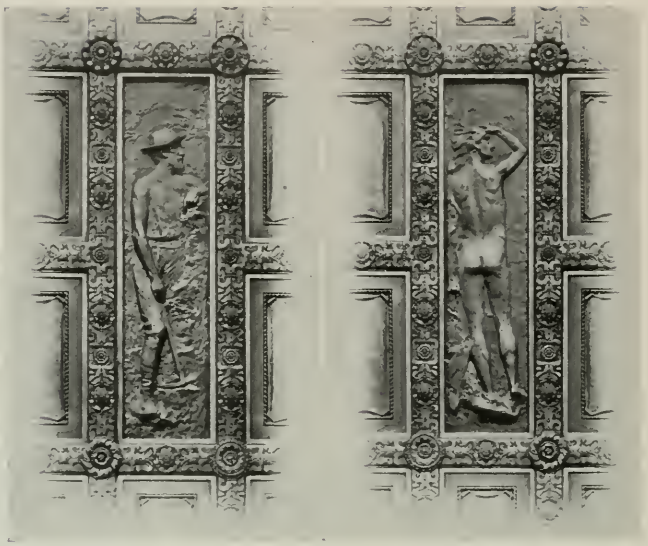


LOUNGING ROOM
HOTEL ST. FRANCIS

DINING ROOM
HOTEL ST. FRANCIS

COLONNADE
SAVINGS UNION BANK & TRUST COMPANY

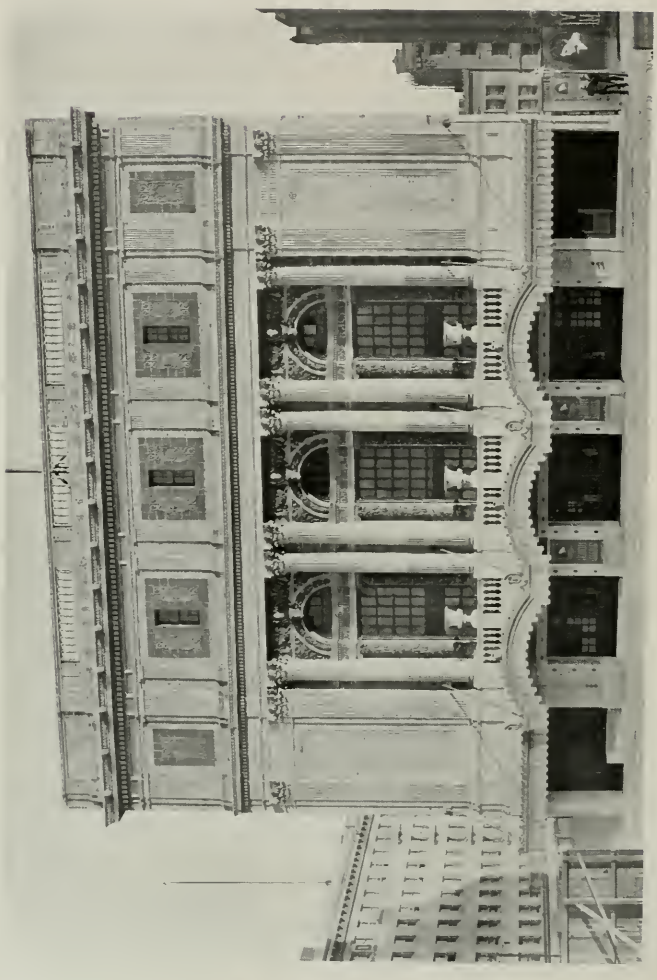
SAVINGS UNION BANK & TRUST COMPANY
SAN FRANCISCO



DETAILS OF BRONZE DOOR
SAVINGS UNION BANK & TRUST COMPANY

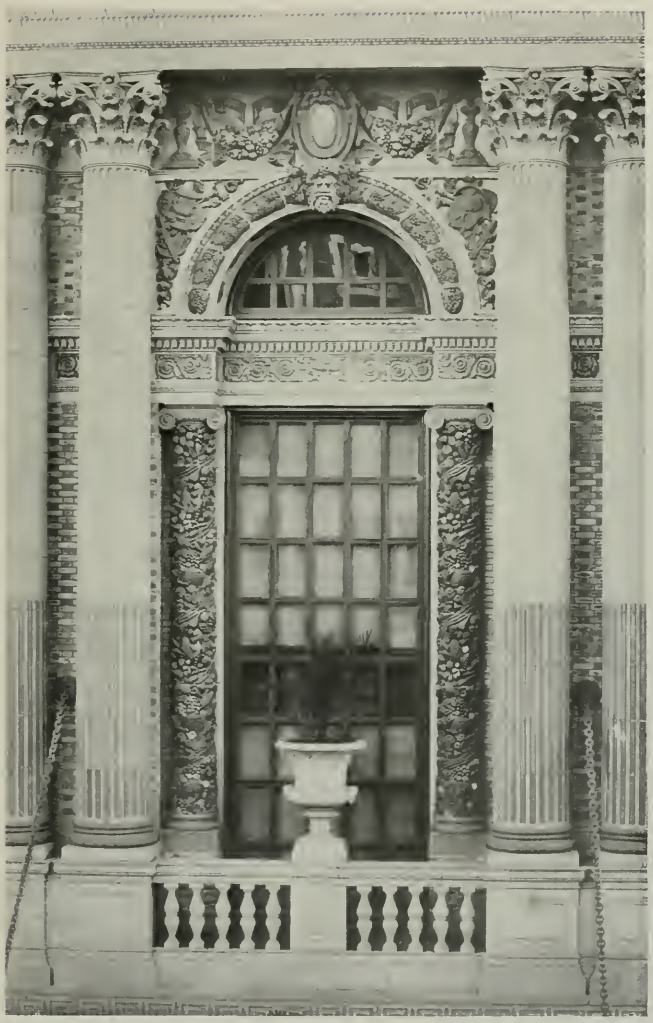
MURAL DECORATIONS, SAFE DEPOSIT VAULTS
SAVINGS UNION BANK & TRUST COMPANY

TAMALPAIS CENTER
KENTFIELD, MARIN COUNTY, CALIFORNIA



COLUMBIA THEATER
SAN FRANCISCO

Polychrome Terra Cotta
by Gladding, McBean & Co.



DETAIL, COLUMBIA THEATER
SAN FRANCISCO

HOSPITAL FOR CHILDREN AND TRAINING SCHOOL FOR NURSES
SAN FRANCISCO

COURT, HOSPITAL FOR CHILDREN
AND TRAINING SCHOOL FOR NURSES

ARCADE, HOSPITAL FOR CHILDREN
AND TRAINING SCHOOL FOR NURSES

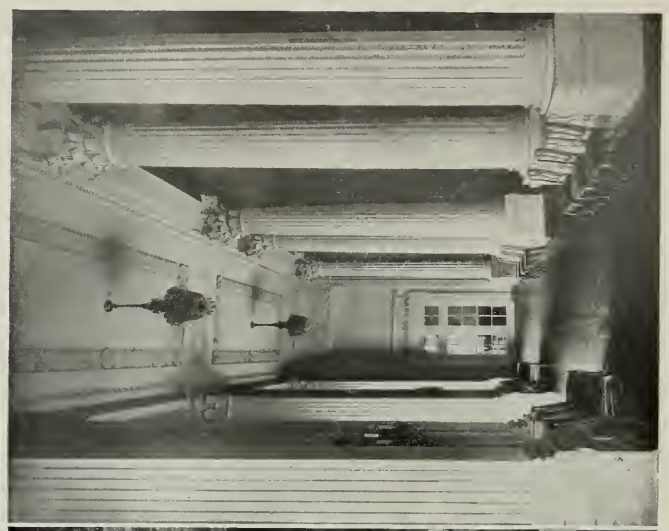
HOTEL OAKLAND
OAKLAND, CALIFORNIA

ARCADE
HOTEL OAKLAND

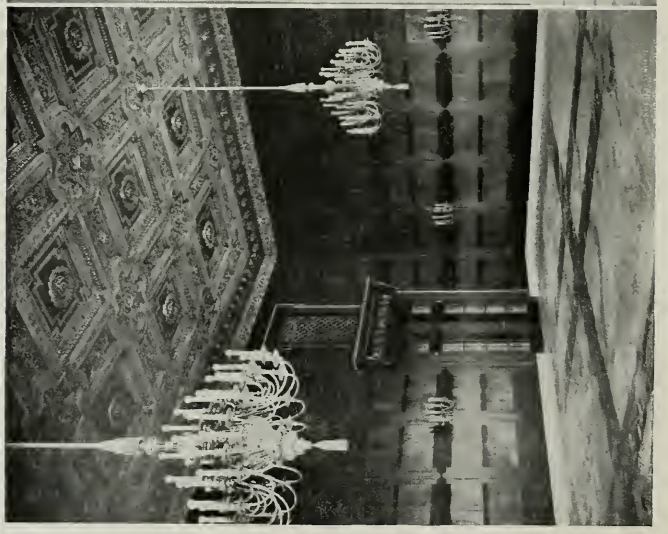
TEA ROOM
HOTEL OAKLAND

LOUNGING ROOM
HOTEL OAKLAND

LOUNGING ROOM
HOTEL OAKLAND



BALL ROOM ALCOVE



CAFE, HOTEL OAKLAND

BALL ROOM
HOTEL OAKLAND

Compared with the old, the new room, decorated by Herter, has the crash and vigor of a brass band in place of the subdued and elusive ravishment of strings.

The Savings Union Bank, also in granite, like the Bank of California, gives the town a clean example of the Ionic order. The facade on O'Farrell street is somewhat thin, as though designed for marble. The interior is more agreeable than the Bank of California by reason of the warmer-toned marble used. The design gets rather ineffective, as it ascends, however, a series of very meagre pilasters finally supporting a ceiling scheme of painted panels that seems almost trivial in comparison with the studied work below.

The University Club Building, like the Oakland Library, is a most successful example of appropriate elegance wrought in great simplicity out of the most inexpensive materials. The refinement and grace of the cornice is notable, even in a city of fine cornices.

The Columbia Theater is a sound study in the correct use of terra cotta, although there are purists who deny that this material should be used in columns. Considering the extraordinary difficulties of polychrome clay for exteriors, the detail is an encouraging success. If there is ever to be an architecture of the future, color will be its basis—color and texture, rather than form.

The Children's Hospital is a San Francisco institution that serves as a record of architectural epochs. First came the mill-made, bay-windowed pile of the early eighties, to be succeeded in the next decade by

LIVERPOOL AND LONDON AND GLOBE
INSURANCE COMPANY'S BUILDING
SAN FRANCISCO

INTERIOR, LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY'S BUILDING

ENTRANCE DETAIL, LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY'S BUILDING

Page Brown's Maternity Home, one of the first examples in San Francisco of the ultra-refined Colonial. In the next decade came Schweinfurth's "Little Jim" ward with its radical form and ragged brick work. The latest expression combines in one the refinement and the texture of the last two. In many respects it marks the beginning of what is proving a new epoch in our treatment of brick work.

The Hotel Oakland is in the same general style, combining lightness of form, careful study of jointing, bonding and color and due regard to the picturesque quality mentioned at the outset. The layout of this building with regard to its fitness for social functions of all kinds and degrees of elaborateness, is quite unsurpassed by any other building on the coast.

The London and Liverpool and Globe Building is a graceful little structure suggesting an Italian Loggia filled with glass windows and turned into an insurance office.

DETAIL OF ENTRANCE
EASTMAN KODAK BUILDING
SAN FRANCISCO

BUILDING FOR EASTMAN KODAK COMPANY
SAN FRANCISCO

BALBOA BUILDING
SAN FRANCISCO

DETAIL, UNIVERSITY CLUB BUILDING
SAN FRANCISCO

MASONIC TEMPLE
SAN FRANCISCO

DETAIL, MASONIC TEMPLE
SAN FRANCISCO

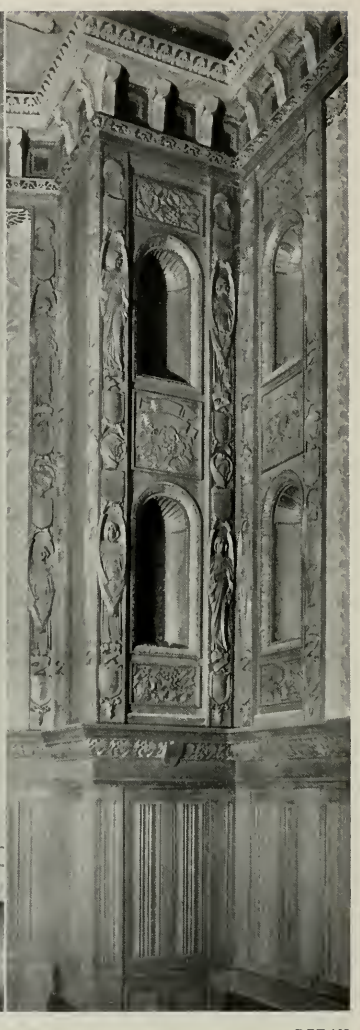
COMMANDRY, MASONIC TEMPLE
SAN FRANCISCO

COMMANDRY, MASONIC TEMPLE
SAN FRANCISCO

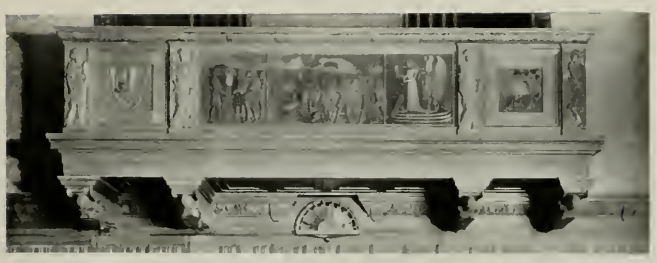
MASTER'S STATION, LODGE ROOM NO. 4
MASONIC TEMPLE

ORGAN GALLERY, LODGE ROOM NO. 1
MASONIC TEMPLE

DETAIL
LODGE ROOM NO. 1

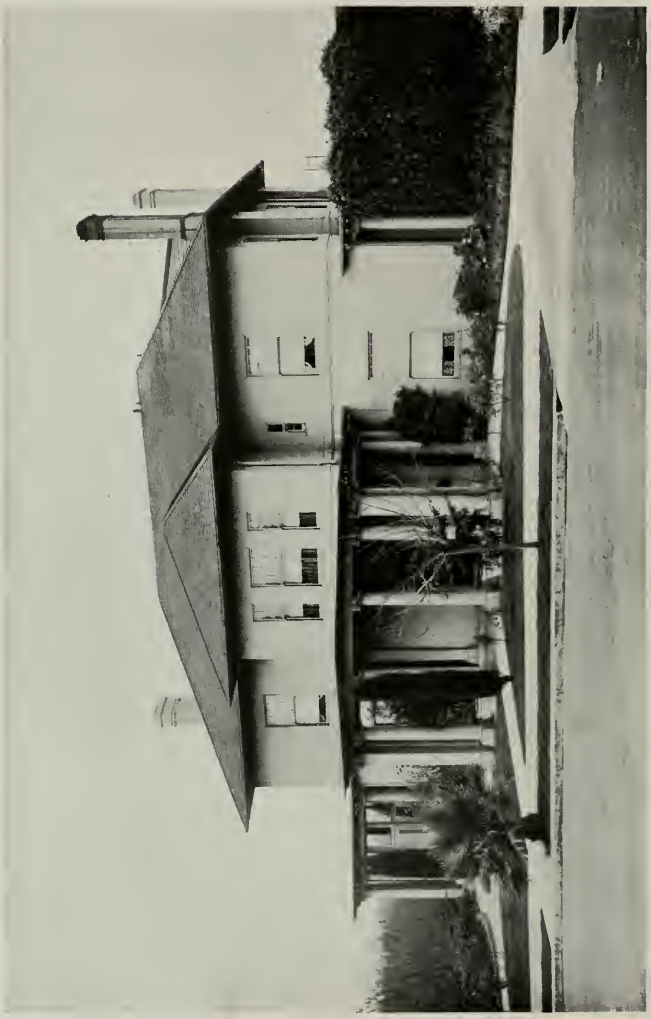


DETAIL
LODGE ROOM NO. 2



DETAIL OF ORGAN GALLERY
MASONIC TEMPLE

ENTRANCE LOBBY
MASONIC TEMPLE



RESIDENCE FOR MR. G. D. ABBOTT
PIEDMONT, CALIFORNIA

GARDEN FRONT
RESIDENCE FOR MR. F. W. McNEAR

RESIDENCE FOR MR. F. W. McNEAR
MENLO PARK, CALIFORNIA

RESIDENCE FOR MR. C. O. G. MILLER
SAN FRANCISCO

RESIDENCE FOR MR. WM. MAYO NEWHALL
SAN FRANCISCO

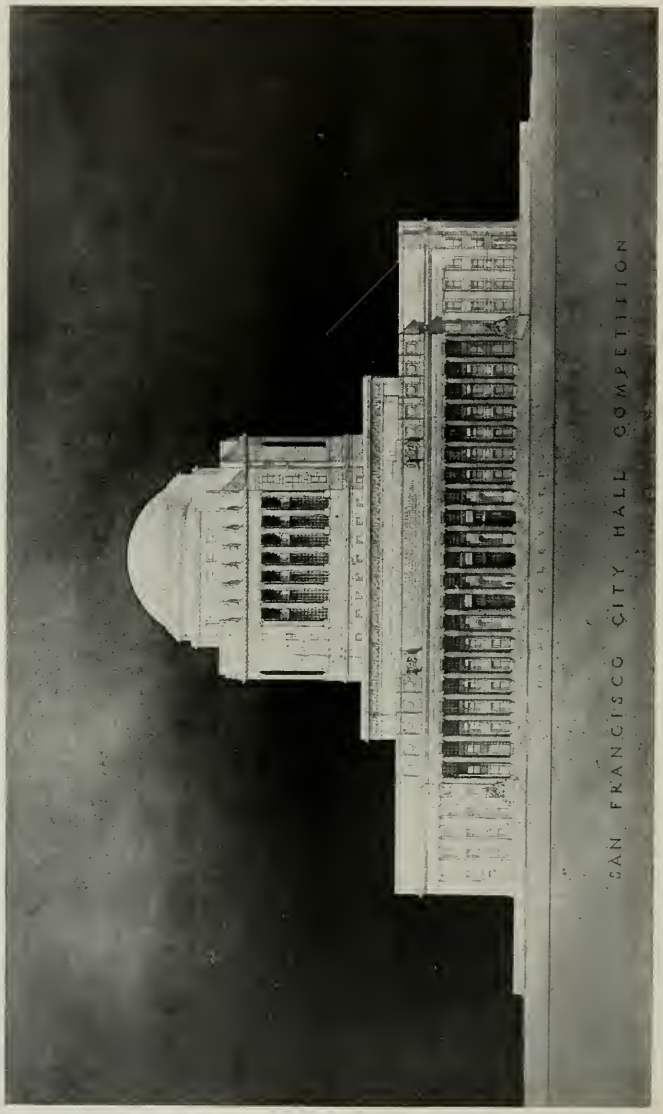
RESIDENCE FOR MRS. FLORENCE BLYTHE MOORE
PIEDMONT, CALIFORNIA

RESIDENCE FOR MRS. FLORENCE BLYTHE MOORE
PIEDMONT, CALIFORNIA

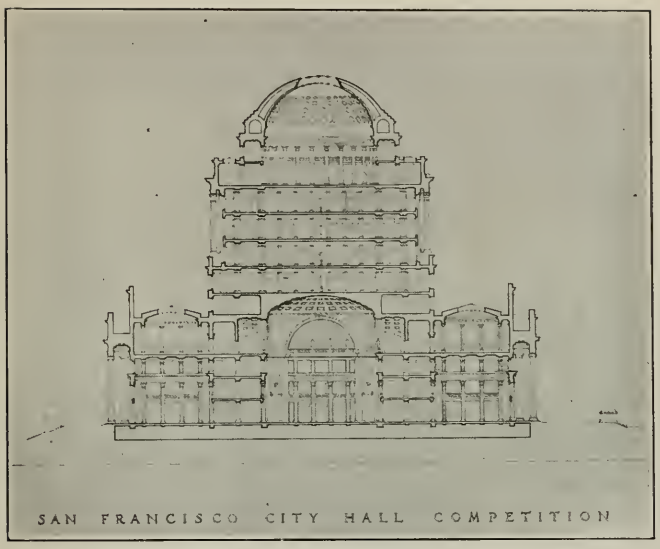
FIREPLACE IN RESIDENCE FOR MRS. FLORENCE BLYTHE MOORE
PIEDMONT, CALIFORNIA

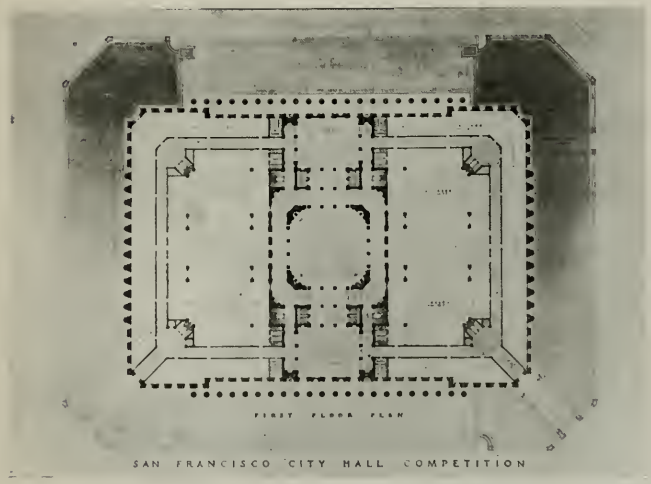
RESIDENCE FOR MRS. FLORENCE BLYTHE MOORE
PIEDMONT, CALIFORNIA

RESIDENCE FOR MRS. R. D. GIRVIN, SAN MATEO COUNTY, CAL.

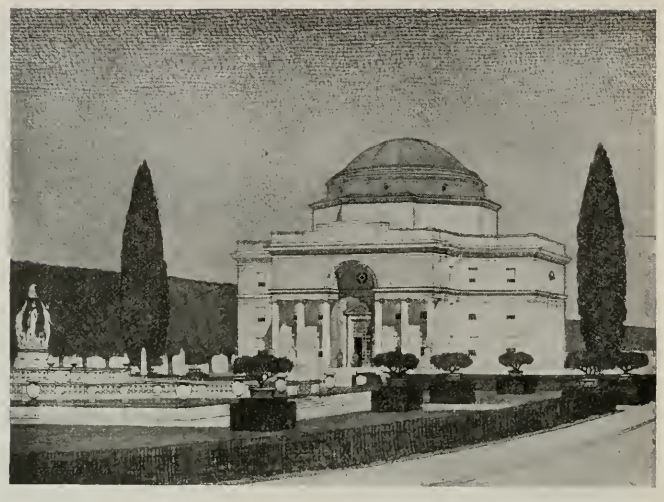


COMPETITIVE DESIGN FOR SAN FRANCISCO CITY HALL.

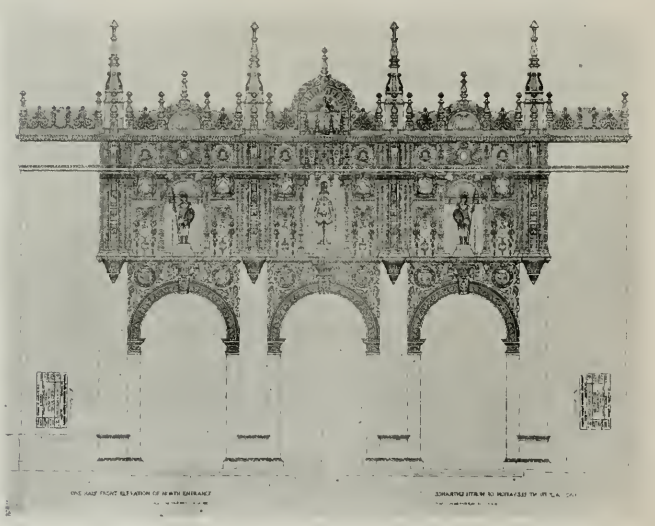




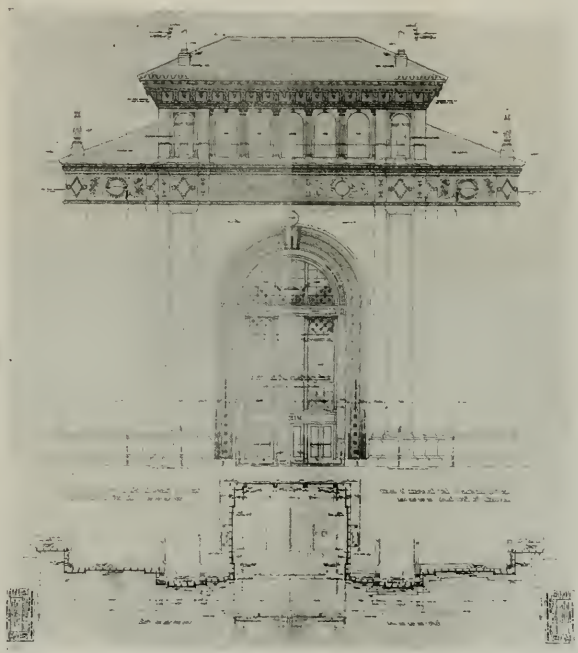
SECTION AND FIRST FLOOR PLAN
SAN FRANCISCO CITY HALL COMPETITION



ADMINISTRATION BUILDING
AT ASCADERO, CALIFORNIA



ELEVATION NORTH ENTRANCE,
BUILDING FOR PANAMA-PACIFIC
INTERNATIONAL EXPOSITION



PANAMA-PACIFIC INTERNATIONAL EXPOSITION, SAN FRANCISCO

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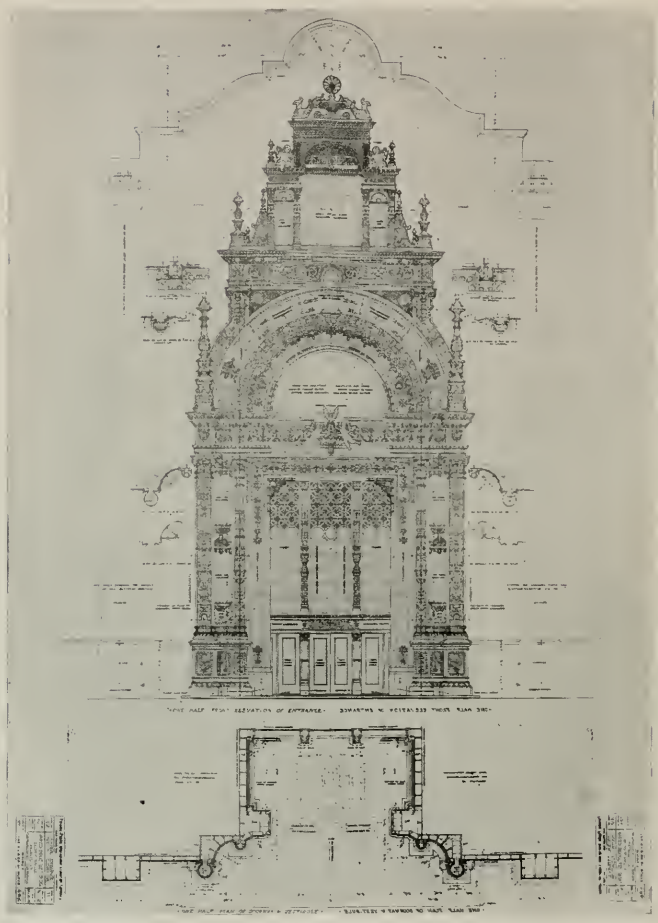

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FRONT ELEVATION
VARIED INDUSTRIES BUILDING

The Masonic Temple marks the culmination of work to date turned out by a firm whose most important service to architecture is probably yet to come, despite the fine showing of these pages.

The pictures tell plainly of the scope, the importance and the high effort of the work done. To dwell on their points of excellence would take more space than this magazine affords. And since brevity has been aimed at, we have in the main spoken of their few defects, therefore, rather than of their many merits.

Forecast of 1914 Building Record

IN SAN FRANCISCO

THIRTY-FIVE million dollars is a conservative estimate of the total building operations in San Francisco for 1914. This forecast is based upon reports from architects' offices, banking interests, the Municipal Department of Architecture and the Director of Works of the Panama-Pacific Exposition. With the possible exception of the exposition work the figures represent what would constitute a normal year's expenditure of a fast-growing city like San Francisco. Already the financial situation is clearing, and there is every reason to believe that the banks will be more liberal with loans in the early spring. If they are, a splendid year for the building industry will follow, for there are scores of property owners ready to build if given financial assistance. The city needs more hotels and apartment houses to handle the exposition crowds, a fact that was apparent during the recent Portola celebration, when people were turned away and some of the hotels had to place cots in the halls to take care of their guests.

The total building record for 1913 was $32,797,259, or almost $10,000,000 short of January, 1913, prognostications. The slump was due largely to the financial situation, the banks declining to negotiate new loans of any considerable size. Estimates of building construction for this year may be classified as follows:

Municipal buildings	$ 6,500,000
Panama-Pacific buildings	10,000,000
Office and store buildings	10,000,000
Hotels and apartment houses	5,000,000
Miscellaneous	3,500,000

In the down-town section at least four notable office structures are assured, since none of them is dependent upon bank loans. The Hobart estate has already let two or three contracts in connection with its 22-story skyscraper to be erected on the site of the old Postal Telegraph building on Market street, near Montgomery. This structure will cost close to $1,000,000. Within two blocks—to be exact, the corner of Montgomery and Pine streets—the Sweeney heirs will build a fourteen-story store and office building, costing not less than $750,000, while on the same side of Market street as the Hobart building, but a block west, Mr. William H. Crocker will build a lofty addition to the Crocker building. The present structure is eleven stories, with a two-story annex on the west side. This annex was erected hurriedly after the fire and never has been considered a permanent building. It will be razed and replaced with an eleven-story Class A structure to cost approximately $600,000. At Market and Fourth streets Mr. John D. Spreckels will erect a $1,100,000 skyscraper that for height will tower above all other architectural peaks in this city. Architects Reid Bros. have designed this 26-story building, and they have been given orders to complete the working drawings in anticipation of an early start on the structure. All of the leases on the present three-story building expire this year. It is possible the new building will be built around the old structure so the occupants can remain until their leases run out.

In the matter of hotels and apartments, several large ones are contemplated, including a seven-story $200,000 Class C building on Sutter street for Lachman Bros.; a $250,000 building for Selah Chamberlain on Nob Hill, a twelve-story, 500-room Class A hotel on the old Y. M. C. A. site, now being promoted by Boston capital; and a seven-story Class C hotel at Post and William streets for Messrs. Trowbridge and Perkins.

THE DIRECTOR OF WORKS, Panama-Pacific Exposition, estimates that the Exposition Company will let contracts during the year aggregating $2,500,000. This, of course, is a rough estimate and does not include work to be done by the various states and foreign governments, which will spend on building construction at least three and one-half million dollars, and the concessionaries will spend for the same purpose about $4,000,000, making a total of about $10,000,000 for exposition work.

ARCHITECTS WILLIS POLK & COMPANY, Merchants' Exchange Building, have about $2,000,000 worth of work under way or in prospect. This includes the 22-story Hobart Building, work upon which has been started; the addition to the Mills Building, which will cost in the neighborhood of $350,000; the Cuyler Lee garage in Oakland, costing $60,000; two residences in San Francisco costing $50,000 each, and the Crocker mansion in Burlingame. Architect Polk's name has been mentioned in connection with a splendid new building for the Fireman's Fund Insurance Company, to be erected on property owned by the company on California street. While it is admitted that the company will build here, no positive information is obtainable at this time.

ARCHITECT LEWIS C. HOBART, Crocker Building, already has about $2,000,000 worth of work on the boards. This includes a substantial addition to the Crocker building on Market street, which will cost anywhere from $500,000 to $1,000,000, the exact size and height of the structure being at present problematical. Mr. Hobart is completing the working drawings for the University of California Hospital to be erected west of the present buildings of the Affiliated Colleges and to cost $600,000. The hospital will be Class A. The cornerstone will probably be laid in February. Architect Hobart is also preparing working drawings for a $20,000 Day Nursery building to be erected at Second and Folsom streets for the Kip Memorial Mission and Day Nursery, Inc. Contracts have been let in the same office for part of the work in connection with a Museum building in Golden Gate Park. The same architect is preparing preliminary sketches for a Class A office building to be erected in Fresno.

ARCHITECT FREDERICK H. MEYER, Bankers' Investment Building, is preparing plans for a seven-story Class C hotel to be erected at Post and Williams streets for Messrs. Trowbridge & Perkins, and to cost $100,000. The building will contain 100 rooms, all of which will have private baths. Work is now in progress from plans by the same architect for a physicians' building, Trowbridge & Perkins owners, on Sutter street. This will cost $200,000 or more. Architect Meyer also has plans in prospect for several power houses and sub-stations for the Pacific Gas & Electric Company. Plans have also been drawn for the reconstruction of the Stanford Museum building at Palo Alto, and a $200,000 residence for I. W. Hellman, Jr.

ARCHITECTS REID BROS., California Pacific Building, estimate that the new work in their office this year will exceed the three-million mark. The largest item will be the Spreckels building to be erected at Fourth and Market streets, and which will cost $1,100,000. This structure will be 26 stories high, and work will be started inside of 90 days. Other commercial work in hand will total $900,000, and this includes a seven-story building for the Sharon Estate back of the Palace Hotel and a $300,000 office building in Oakland. This firm also has work in prospect amounting to $500,000 for Class B apartment houses and $75,000 in Class C construction. A hotel in Portland to cost $350,000 is also assured.

ARCHITECT O. R. THAYER, Merchants' National Bank Building, reports that construction has just been started on the B. Davidow garage on Van Ness avenue, which will cost approximately $50,000. The same architect will shortly complete plans for a one-story reinforced concrete produce market to be built on Union street, east of Fillmore, at a cost of $10,000. Mr. Thayer has under way plans for a six-story concrete hotel building to be erected on Bush street near Kearny, having 70 per cent baths, automatic elevators, steam heat, etc., and to cost $30,000. Plans are also being drawn for two residence flats on Second avenue for S. P. Russell to cost $6,500.

ARCHITECT ALBERT FARR, Foxcroft Building, has plans for a score or more handsome residences, some of the owners being H. B Allen, who will erect an $8,000 house at Sea Cliff; Dr. Gilbert Graham, a $10,000 house at Claremont; Railroad Commissioner Max Thelen, a $10,000 residence in Claremont; George Sargeant, a $10,000 house at Twenty-fourth and Lake streets; Jack London, a $40,000 country house at

Glen Ellen; H. M. Wright, a $12,000 residence in Claremont; John Spohn, a $25,000 house and garage at Claremont; O. A. Smith, a $5,000 house in St. Francis Wood; a club house and garage for the Belvedere Land Company costing $8,000, and a group of forty-eight houses to be built on Eighth avenue in the Sunset District for Allen & Company, and which will cost from $3,500 to $4,500 each.

ARCHITECT J. R. MILLER, Lick Building, has work in prospect aggregating $250,000. This includes an office building, several apartment houses and a garage. Much of Mr. Miller's work will be for the Rudolph Spreckels interests. Mr. Miller has under construction an addition to the Metropolitan Life Insurance Building, costing about $125,000.

The Consulting Board of Architects of the City of San Francisco estimates the following work in that department, some of which is already under way, including the City Hall and Auditorium:

City Hall, Class A	$3,500,000
Auditorium, Class A	1,200,000
San Francisco Hospital, yard improvements and fixtures	1,000,000
City and County Jail, completion	175,000
Potrero Emergency Hospital, Class A	17,500
Auxiliary Fire Alarm Station	40,000
Engine House Number 12, Class C	65,000
Engine House Number 48, Class C	33,000
Cooper School, reinforced concrete	100,000
Washington Irving School, brick and steel	100,000
Oriental School, brick and steel	118,000
Marsball School, frame	80,000

ARCHITECTS O'BRIEN & WERNER, Foxcroft Building, have completed revised drawings for the San Francisco Labor Temple, a four-story steel and brick building to be erected at Sixteenth and Capp streets, at a cost of $70,000. The same architects have made plans for a handsome country residence in Pleasanton, and they have prospects for several good-size apartment houses.

ARCHITECTS BAKEWELL & BROWN, 251 Kearny street, are now engaged upon preliminary sketches for about $700,000 worth of new work, which includes a substantial addition to the Lane Hospital at Clay and Webster streets. The building will probably be five stories, Class A, and will cost $100,000. Contracts have just been let by this firm for a three-story-and-basement store and hotel building at Tenth and Franklin streets, Oakland, for G. E. and S. E. Ellis. Plans are being prepared by the same firm for a number of costly residences.

ARCHITECTS WARD & BLOHME, Alaska Commercial Building, have just completed working drawings for a two-story-and-basement municipal firehouse for motor apparatus to be erected by the City of San Francisco at Commercial and Drumm streets. The building will cost about $60,000. The same architects have under construction a four-story Class C addition to the Children's Hospital at California and Maple streets. Plans have been prepared by the same architects for a substantial addition to the Cliff House. Drawings are in progress for a residence and studio for Haig Patigian, the sculptor. Sketches have been prepared by the same firm for a $200,000 apartment house to be erected in the Nob Hill section.

ARCHITECT T. PATTERSON ROSS, 310 California street, is taking figures for the structural steel for a seven-story-and-basement steel and concrete apartment house to be erected on Greenwich street and which will cost approximately $120,000. The building will be 100x70 feet and will contain fourteen apartments of six and seven rooms each. The same architect will let contracts in the near future for a four-story-and-basement Class C store and hotel building on the northeast corner of Sixth and Clara streets for the Hamburger Investment Company. The cost is estimated at $80,000.

ARCHITECT J. MARTYN HAENKE, 1114 Story Building, Los Angeles, and Engineer H. J. Brunnier, Sharon Building, San Francisco, are preparing plans for a fourteen-story Class A bank, store and office building to be erected on the northeast corner of Montgomery and Bush streets, the site of the old Occidental Hotel. It is estimated this building will cost close to $1,000,000. There will be between six and seven hundred offices. The ground area is 330x195 feet and there will be provision for two banks and a number of stores on the ground floor.

ARCHITECT G. ALBERT LANSBURGH, Gunst Building, has under construction a Class C hotel for A. Eisenberg and is preparing plans for a $75,000 addition to the Concordia Club on Van Ness avenue. This will include a gymnasium and concrete swimming tank. Mr. Lansburgh has also made plans for an automobile building to be erected on the grounds of the Panama-Pacific Exposition.

ARCHITECT EDWARD T. FOULKES, Crocker Building, has about one million dollars' worth of work on the boards. This includes the Oregon State Building for the Panama-Pacific Exposition, to cost $100,000; the Inside Inn for the Panama-Pacific

Exposition, to cost $500,000; hotel for the Columbia Realty Company to cost $75,000, and a Class A theater for the down-town section to cost $200,000.

ARCHITECT WILLIAM H. WEEKS, 75 Post street, has work aggregating $500,000 for which actual working drawings are being made. This work is summarized as follows: Eureka High School, $120,000; Ceres Grammar School, $35,000; Monterey High School, $35,000; Watsonville Theater, $50,000; four-story building and addition to Mansion House, Watsonville, for the Luttenich Bros., $100,000; building for George F. Brewington, Watsonville, $15,000; First National Bank Building, Bakersfield, $65,000; Turlock Opera House, $50,000; Bank of Chowchilla, $10,000.

ARCHITECT AUGUST NORDIN, Mills Building, estimates prospects in his office for this year totaling close to $340,000. Part of this work is dependable upon the banks making the necessary loans to his clients. The work will include hotels and apartment houses of a high class. One building that will go ahead without delay is a reinforced concrete hotel in the Mission district, to cost in the neighborhood of $20,000.

ARCHITECT HOUGHTON SAWYER, Shreve Building, writes as follows: "There is approximately $1,000,000 worth of building in preparation in this office. I am not at liberty to go into details at this date. It is impossible to forecast what other work may come in."

It is very probable that the "Burlingame Court," a high-class apartment hotel designed by Mr. Sawyer, and for the construction of which preliminary estimates were taken last summer, will materialize this year. The building will be erected on a prominent corner in the vicinity of Nob Hill, and will cost $500,000. Mr. Sawyer has also completed plans for a high-class school building to be erected by the City and County of San Francisco this year, and which will cost in the neighborhood of $100,000.

ARCHITECTS SMITH & STEWART, Marston Building, have prospects of quite a little work, including a new town hall for Daly City and an apartment house in San Francisco. This firm made plans last year for a high-class apartment hotel to be erected in Sacramento, and this job will in all probability go ahead in 1914.

ARCHITECT EDWARD G. BOLLES has plans for a number of attractive residences, among them a $15,000 home to be erected on the east side of Twenty-fifth avenue, north of West Clay street, for Mrs. Josephine Nahl.

ARCHITECT B. R. MAYBECK, Lick Building, has plans for several costly residences, both in the city and out of town. Work has just been started on a fine city home for E. C. Young, manager of the Walk Over Shoe Company, in Forest Hill. This house is designed along old English lines with exterior of half timber, plaster and shingles. There will be a concrete garage.

In St. Francis Wood there will be quite a little building this year. J. M. Ruth will erect a $10,000 home there, and others who will build are Louis P. Steller, George W. Brooks, secretary of the California Insurance Company, and Frederick M. Gibbs. Plans for the latter's house have just been completed by Architect Henry H. Gutterson.

ARCHITECTS CUNNINGHAM & POLITEO, First National Bank Building, have a large amount of work under way for the coming year. A $25,000 brick and marble crematory for the California Cremation Society, Inc., will be erected at once at Fresno, Cal. A two-story-and-basement home for Mr. Carl Martin, assistant manager of the Emporium, will be erected in West Lake Park at a cost of about $6,500. A two-story-and basement brick school to cost $50,000 will be at once erected for the State University at the State Farm, Davis, Cal.

ARCHITECT A. W. CORNELIUS, Merchants' National Bank Building, has the working drawings well advanced for a two-story-and-basement Class C school building to be built at a cost of $50,000 for the town of Pittsburg, Contra Costa county. Exterior will be of pressed brick, terra cotta and galvanized iron trim, steam heating plant, oil burner and vacuum cleaning systems. There will be a frontage of 240 feet with two wings, twenty class rooms and assembly hall to seat 700. Mr. Cornelius is also preparing plans for several motion picture theaters.

ARCHITECT SIDNEY B. NEWSOME, Nevada Bank Building, has plans ready for figures on several attractive buildings, among which are a three-story frame apartment house for Mr. J. V. De Ryana to be built on California street between Fifth and Sixth avenues, at a cost of $12,000, and a two-story-and-basement frame residence for P. A. Dinsmore of Oakland, to cost $10,000.

ARCHITECT HENRY C. SMITH, Humboldt Bank Building, has a large Class C school building now under construction, costing $70,000, at Fairfield, Solano county, and he has drawings nearing completion for a $70,000 hotel for the same town, to be erected for a syndicate headed by Mr. J. N. Watson, director of the Chamber of Commerce of Fairfield. This structure will be of reinforced concrete, three stories and basement, and will be about 150 feet square with a 60-foot patio in the center.

ARCHITECT CHAS. E. HODGES, Bankers' Investment Building, is now preparing plans for an elegant residence to be erected in St. Francis Wood, San Francisco, for Mr. H. J. Jones, assistant treasurer of the Southern Pacific. It will be a two-story-and-basement home of frame and plaster and will cost in the neighborhood of $20,000.

ARCHITECTS WM. KNOWLES and ERNEST COXHEAD, associated, Hearst Building, have plans well advanced for a church to cost $60,000 for the Plymouth Brethren Congregation of Oakland. It will be erected on Piedmont avenue. Brick and stone construction, seating capacity 1,500; English Gothic style of architecture; tower 100 feet high, pipe organ, stained-glass windows, etc. Mr. Coxhead also has plans completed for a residence for Dr. Henry Walter Gibbons, to be erected at a cost of $9,000 on California street, near Twenty-first avenue. Mr. Knowles has plans for a two-story-and-basement Class C store and loft building to be built on Mission street, near Sixth, for Mr. Duncan. It will cost $15,000. In addition to this building, another is under way of similar design and cost for Miss Carrie Rea of San Jose. Architect Knowles is also preparing plans for the immediate erection of a choice residence in the prevailing Spanish style for Mr. Wm. C Murdoch, Jr. It will be built in Forest Hill, San Francisco, and will cost $25,000.

ARCHITECTS FABRE & BEARWALD, Merchants' National Bank Building, have a three-story-and-basement frame apartment house under construction, costing $15,000, at Pacific avenue, west of Jones street, San Francisco, for Mr. A. Artru. These architects will let a contract at once for a two-story reinforced concrete building for laundry purposes. It will cost $7,500 and be erected for M. Betcave on Ellis street, west of Hyde street, San Francisco.

ARCHITECT LOUIS MASTROPASQUA of 580 Washington street, San Francisco, has figures all in for a three-story frame apartment house to be erected for Mr. Victori Sattui, Twenty-third and Bryant streets, San Francisco. It will cost $15,000.

The National Ice Company, through its engineer, Mr. Charles Wallace, is now letting segregated contracts for a $70,000 five-story Class A cold-storage building, to be erected on Battery and Union streets. The structural steel is already being fabricated by the Vulcan Iron Works. The structure will be 90 by 120 feet.

ARCHITECT M. MATTANOVICH, 995 Market street, is taking sub-bids on a three-story-and-basement apartment house to be erected for Lachman Brothers of San Francisco at a cost of $40,000. There will be five stores and 34 apartments of three and four rooms each. The exterior will be of white Portland cement.

ARCHITECT G. A. APPLEGARTH, Call Building, has prospects of about $350,000 worth of new work, including a substantial addition to the Bekin Van & Storage Warehouse, a reinforced concrete garage for A. B. Spreckels, a commercial building to be erected in the wholesale section and to cost $200,000, and a frame apartment house on Nob Hill, costing $40,000. Mr. Applegarth is also the architect of the Clift Hotel, now under construction on Geary street.

ARCHITECT W. G. HIND, Maskey Building, is completing working drawings for a six-story Class A apartment house to be erected on the northwest corner of Sacramento and Jones streets for Dr. Redmond Payne, and to cost $130,000. The building will have steel frame, pressed brick and terra cotta exterior and all modern conveniences. There will be two apartments of eight rooms each to a floor.

ARCHITECT HERMAN BARTH, 16 Geary street, is preparing working drawings for a Class C apartment house to be erected on California street in the vicinity of Hyde, at an estimated cost of $70,000. Construction will be steel and brick, with pressed brick and terra cotta exterior. There will be 36 apartments of two and three rooms each. Mr. Barth has one or two other apartment houses in prospect for which preliminary sketches have been made.

ENGINEER G. B. ASHCROFT, Balboa Building, is taking figures for the construction of a seven-story-and-basement Class C steel frame hotel on O'Farrell street, near Powell, to cost $100,000. The exterior will be faced with red pressed brick. There will be 100 rooms, tile baths for every floor, electric passenger elevator, stores on the ground floor, etc. The owner is C. A. Hooper.

ARCHITECT CHARLES J. ROUSSEAU, 46 Kearny street, has plans for two Class C hotels for Edward H. Mitchell. One of these buildings has just been started and is at Scott and Lombard streets. The other will be at Steiner and Lombard streets, and they will cost about $30,000.

ARCHITECT CHARLES PETER WEEKS, Mutual Savings Bank Building, is preparing the working drawings for a group of hospital and infirmary buildings for

Alameda county, and which will cost in the neighborhood of $1,000,000. It is hoped to start construction on one or more of these buildings late in the spring. The same architect has plans for the reconstruction of the Union Iron Works Company's plant in South San Francisco. The old buildings are to be replaced with modern structures and some of this work is already well under way.

ARCHITECTS ROUSSEAU & ROUSSEAU, Monadnock Building, write as follows:

In answer to your letter of recent date requesting a report of the probable volume of business we anticipate during this year (1914), we are pleased to say that from the outlook to date we expect to do over one million dollars' worth of business, as at the present time we have over $500,000 worth of business on the boards.

We have just started the erection of a two-story Class A steel frame theater building for Nellie Harris upon her lot on the north side of Broadway, west of Grant avenue. This theater will have a seating capacity of 2,000, and when completed will be one of the most substantial structures of its kind in this city. The exterior is finished in cement plaster and will cost $50,000.

We are preparing plans for a three-story frame apartment building to be erected at Prince and Telegraph avenue, Berkeley, for W. R. Scott, general manager of the Southern Pacific Company. This building will contain thirty-five apartments of two, three and four rooms each, and will cost in the neighborhood of $45,000.

We have let contracts for the erection of a six-story Class C brick apartment building to be erected on the southwest corner of California and Stockton streets, San Francisco. The building will contain 72 apartments of two and three rooms each and will be erected at a cost of $105,000. The owner is the Portola Realty Company.

Following is a list of a few of the buildings for which we are now preparing plans:

A four-story-and-basement reinforced apartment building to be erected for J. B. Reite upon his lot on the south side of Post street, west of Larkin. There will be 38 apartments of two and three rooms each. The estimated cost is $40,000.

A three-story frame apartment building on the southwest corner of Greenwich and Larkin streets containing 35 apartments of two and three rooms each.

A four-story-and-basement apartment building for Dr. Baird, to be erected upon his lot situated on Oak street north of Fourteenth street in the city of Oakland. The building will contain 28 apartments of two, three and four rooms each, and will cost $40,000.

A one-story brick garage building for F. W. Taylor, to be erected on the northeast corner of Brook street and Broadway, Oakland. The building has been leased to the Howard Auto Sales Company and will be erected at a cost of $15,000.

A two-story brick garage building for J. Sather, to be erected upon his lot on Shattuck avenue and Haste street, Berkeley, at a cost of $15,000.

A three-story frame apartment building for Mr. Hampton, to be erected on the corner of Twenty-second and Valley streets, Berkeley. The building will contain 20 apartments of two and three rooms each, and will be erected at a cost of $25,000.

Plans are also being prepared for a two-story residence for Mrs. Gillan, to be erected in the city of Fresno at a cost of $20,000. Also five two-story residences for the Tormey Company, to be built on Thirty-third avenue, near Lincoln Way, San Francisco, at a cost of $12,000.

ARCHITECTS FRANK T. SHEA & JOHN O. LOFQUIST, Bankers' Investment Building, report the following work in prospect for 1914:

Mission Dolores Church, Sixteenth and Dolores streets	$200,000.00
Sts. Pietro E Paolo Church (Italian Church), north side of Filbert street, east of Powell street	200,000.00
St. Paul's School, Twenty-ninth and Church streets	70,000.00
Pumping station, Holy Cross cemetery	20,000.00
Star of the Sea Church, Eighth avenue and Geary street	50,000.00
Chapel at St. Patrick's Seminary, Menlo Park	100,000.00
Providence Hospital, Oakland, Cal.	125,000.00
Sacramento School, Sacramento, Cal.	200,000.00
Receiving vaults, Haywards cemetery, Haywards	50,000.00
Kennedy Hotel, southwest corner of Ellis and Larkin streets	40,000.00
St. Patrick's Church, Mission, near Third streets	100,000.00
Juan Cooper's residence, Monterey, Cal.	30,000.00

Who's Who in Pacific Coast Architecture

II.—Clarence Richard Ward.

AMERICAN architecture has made a distinct advance during the past two decades. This agreeable change is no doubt due principally to the character of the men who are engaged in this profession. Progress in architecture in San Francisco is due largely to men who, like

Clarence R. Ward, have made extensive study and research. Mr. Ward was born in Niles, Michigan, December 19, 1870. At the age of six years he came to California, where he received his public and high school education. Later he went to Oakland and was given a special four-year academic education at the California Military Academy, and at the same time received valuable practical training in the offices of prominent architects in Oakland. Since 1885 he has been almost continually preparing for and practicing the architectural profession. In 1890 Mr. Ward went to Atlanta, Ga., and spent four years in practicing general architecture with the firms of Burnham & Root, Bruce & Morgan and Henry W. Norman. He then returned to San Francisco and became associated with Architect Frank T. Shea. Later he entered the office of Edward R. Swain, where he aided in the construction of the Ferry Building and other important structures. Mr. Ward succeeded Mr. Swain and finally consolidated his practice with that of Henry H. Meyers. During this affiliation the firm designed many important buildings, among which are the Alaska Commercial, the Wells-Fargo, and the reconstruction of the Kohl building, the execution of the Hobart buildings, six buildings of various classes for Hyman Brothers, Samuels' Lace House building, Goldberg-Bowen building, Stockton Savings and Loan building, and the People's Savings Bank building, Sacramento. The firm constructed some sixty buildings of all classes since the fire. Mr. Ward is now associated in practice with J. Harry Blohme. Their principal executions have been the Stanford Memorial church; Children's hospital and the Machinery building for the Panama-Pacific Exposition. As an evidence of his efficiency, Mr. Ward was for some time a member of the State Board of Architecture, and is at present a member of the Architectural Commission, P. P. I. E. He is an enthusiastic member of the San Francisco Chamber of Commerce, a member of the Pacific Union, Bohemian and Olympic Clubs, is a former president of the Family Club, a member of the Merchants' Exchange, an honorary member of the San Francisco Architectural Club, and secretary of the San Francisco Society of Architects.

* * *

Grooved Boards for Cement Plaster Work Not Satisfactory

Architects and builders who have been using the grooved redwood boards in place of metal lath as a back-ground for cement plaster in residence work are very much disgusted. The recent hard rains have soaked through the plaster to the redwood, and no sooner does the water strike the wood than it becomes badly discolored. Finding its way outside again, the chocolate-colored fluid drips over the surface, streaking it up so badly that the exterior presents the appearance of having passed through a smoky fire or a bombardment of mud. Of course the only thing to be done is to tint the plaster work with a waterproofing paint. It is noticed, too, that the plaster, when placed over the grooved boards, cracks much more easily than on metal lath. There is no question but that it is a mighty unsatisfactory method of construction—cheap, perhaps, for the contractors—but expensive indeed for the owner.

The Charm of New Orleans

By C. H. Whitaker, Architect and Delegate to the Recent A. I. A. Convention.

AND what is this wonderful charm of New Orleans—a charm possessed by no other city in America? A charm which hovers over her streets and squares—her shuttered windows, her balconies, decked with exquisite bits of wrought iron; her gardens, smiling to the passer-by, or, what is still more charming, haunting him with the vision inspired by the top of an old oleander, glimpsed above a moss-covered wall.

Ah! these are some of the things seen from which she draws her charm yet one can scarcely define the multitude of things unseen—the swift spirits of thought that carry one here and there, as suggestions follow quickly upon the heels of vision. To walk the streets of old New Orleans is to review, in your memory, the history of France for two centuries or more. And mingling among the retinue of kings and queens, soldiers and courtiers, poets, artists, musicians, there defiles the procession of hardy pioneers, the men who brought the indomitable and unconquerable energy of France to this land of bayou and prairie. The history of the Old World intertwines with that of the new—and you want to go back and become a factor in the making. Somehow or other it all seems to have been more interesting, more rose-colored, more filled with the amenities of life than is this rushing river that now bears us upon its swirling tide.

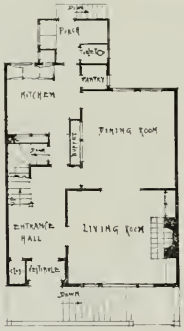
Of such is the charm of New Orleans to me. It seems idle to enumerate her separate "points of interest." They are innumerable—they greet you at every turn. A courtyard beckons you through an arch, a garden calls you from behind a grille or wall, a balcony here, a window there, the pitch of a roof, the curve of a moulding, follow each other in an intoxicating succession of joys and sorrows.

You are happy in thinking of a time when there were builders and craftsmen to do all these things—and to think that they are no more, and that the life of which their handiwork was but a symbol has become only a memory.

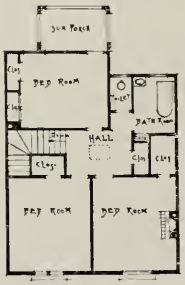
For although the men and women of New Orleans will still extend you the most charming hospitality, and although when nature insists that you shall attend to a well-earned hunger, you may dine in a manner not to be surpassed, I care not where you go, you are still haunted by this insistent vision of something that has gone. You feel that the people you meet in the old quarter are also haunted with the same vision—and that they, too, would like to go back.

But you cannot have charm without a certain sadness, nor will you, for this reason, regret your visit to New Orleans. Its charm will enchant you, come back to you and haunt you until, like thousands of others, you yield to its calling and find yourself once again crossing Bay St. Louis or Lake Pontchartrain and approaching, through a bewildering avenue of live oaks, cypress and palm, this city of charm.

And 'twere well to remember that New Orleans is already a metropolis, rising steadily in the importance of her commerce. Each year sees her a little poorer in the things which call you back—yet even to miss the New Orleans of today is but to pave the way for a regret for which there is no remedy known to man.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

DESIGN FOR A CITY RESIDENCE
FALCH & KNOLL, ARCHITECTS

Developing a New Style — A Rebel in the Camp of Architects*

San Francisco architects will remember Mr. A. A. Cantin, who for a number of years practiced his profession in the Bay City. Mr. Cantin formerly maintained offices in the Phelan Building, and during that period he designed and superintended the construction of the Elks' Club Building in Powell street. Mr. Cantin went abroad about four years ago, to return recently with what he terms a new order of architecture (if such be possible), and to make his findings the more emphatic he has had them patented, and now his brother architects all over the country are either praising or belittling this so-called "discovery."

It may seem strange that an architect's ideas should be subjected to patent, but this new-style architecture possesses unprecedented features, it is said, and the inventor or discoverer reserves the right to supervise any development that may ensue. He is, however, seeking no monopoly, as the license fee for using the style is nominal.

It is very questionable whether it be possible to discover a new order at any time, and still more so in the present commercial age. The practical architect doubtless will detect certain flaws and discrepancies in these designs which subsequent criticism and debate will develop. Meanwhile, anyone seeking intelligently to improve present conditions of architecture in America is rendering yeoman service, and all who disagree with his problems will at least commend Mr. Cantin for his bold attempt to prescribe a new diet for that suffering infant, American Architecture.—Editor.

UNDER the heading "A Rebel in the Camp of Architects," Mr. W. H. de B. Nelson, in the November number of The International Studio, gives an interesting discussion of the Cantin invention, which, he states, is based on a fundamental order of architecture, with the addition of a new arch and column combination. It results from an effort to fathom the reason for the discarding by the ancient Greeks of the combination of the arch and column from their beautiful structures. Although they were fully aware of the use of the arch, yet history does not record any single building of importance where such a combination occurred, which undeniable fact invites reflection. It seems a safe hypothesis, therefore, that they deemed such a combination unfinished, and, consequently, inartistic in design. Of course it is to Italy that we must turn to judge the merits and demerits of past and present style. Past-style arcades betray unfinished structure, lacking in cohesion between column and archivolt; the observer feels a sense of unrest in facing the arch moldings dead-ending upon the top of the abacus. The addition of bolsters and entablatures between the top of the column and the archivolt lends no beauty to the combination nor truth to the construction.

"A most prominent defect in the old arcade is the overhanging of the angles of the archivolt over the periphery of the column, by which a clumsy appearance is obtained, and a fear that the arch may crush the abacus.

"It would be impossible in this short article to go any length in pointing out technical refinements involved. Suffice it to say that in the new-style arch and column the above-mentioned defects are eliminated and the beauty and finish of the capital enhanced by the proper termination of the archivolt moldings upon the column shaft. This new-style architecture should particularly commend itself to architects and sculptors alike, as it offers such splendid opportunities of design and permits them to impress their personality upon a structure, making it more symbolic of

*Mr. Cantin is reported to have returned to San Francisco for the purpose of supervising the construction of numerous models of his work. He also maintains an office in the Mehlhorn Building, Seattle, with Mr. Charles Haynes.

its purpose and more impressively beautiful than is possible with any other style. Then, again, it would give immense scope in group designing of columns; magnificent effects could be assured by different colored marbles being used for capital and shaft. Such a color combination is of immense importance and quite out of the question in old-style architecture.

"The most notable feature is the placing of statues upon consoles in the panels of the capitals, by which means both interiors and exteriors of structures can be enriched. Here again architect and sculptor can cooperate, as in theater foyers and lobbies; public halls and vestibules, too, lend themselves to the most varied treatment, and may thus win fresh interest in the eyes of the visitor. At present, outdoor statues are too high to be admired properly, and are soon disfigured by exposure, but if placed about the column capital in the new style these objections would automatically vanish. Take, for instance, a modern ball room, and very little imagination must show the immense possibilities of Mr. Cantin's design, which lends itself equally to Spartan simplicity or lavish elaboration. Transplant yourself for a moment to the new postoffice in New York City, opposite the Pennsylvania Railroad station. What a splendid field presents itself here for architect and sculptor to unite in placing upon the column capital allegorical figures in keeping with the historical legend carved in the frieze!

"The human figure is the most appropriate decoration for capitals and must surely supersede the present designs, with their monotonous cast-iron appearance. In capitals where the figure or bust is used in a leaf-work design, a jumbled effect is produced and the main motif is lost. A glance at the old-style capitals in elevated positions shows 'spottiness' and fails to give a clean-cut appearance when observed from the ground.

"To create a new architecture it is a sine qua non to possess a fundamental basis. This might ordinarily sound like platitude, but the many efforts to butt against tradition and evolve a new style in this country have failed utterly, for the very simple reason that the modes employed have lacked this essential quality. In Mr. Cantin's design the column architrave with frieze and perforated cornice form a new order of architecture to add to the Doric, Ionic, Corinthian, Composite and Tuscan orders. A new factor is introduced in architectural standards by the column and arch combinations. It has been the custom to place a column of any order under an entablature or arch, without any change in the formation of the capital. As an arch is an entirely different structure from an entablature, why should not the connection differ? The new style adds to the design of a building, creates new motifs, is more flexible, makes a finished connection to the column, and, with well-designed sculpture decoration, fills all requirements for beauty, utility and stability.

"Of what use are heavy, overhanging cornices? On the other hand, beautiful shadow-play may be expected from these perforated cornices in the new style because they are perforated in the farthest overhanging part; open-work partitions may be filled with tracery or with colored glass, the sunlight projecting the colors among the shadows upon the frieze. This is a point of considerable importance if we are to construct with an eye to fine effects.

"In old-style architraves the height is too shallow to carry proportionately the superimposed load, while in the new style this difficulty is obviated by extending the capital right up to the under side of the frieze, which member must be planned in proper relation to the load it carries. The

sculpture work on the panels of the capital has a low relief at the base and center of the panel, heavier at the top, so as to cast proper shadows at the abacus line. In illustration of this precept, the reader's attention is called to Goujon's figures in the Fountain of the Innocents, in Paris. To revert for a moment to the Renaissance period, it is interesting to reflect what use architects and sculptors would have made of this new-style architecture in their column capitals and perforated cornices. As the column capital bears the shape of the Latin cross, it is safe to say that all their ecclesiastical architecture would have been carried out in this style and enriched with madonnas, Christ on the cross, saints and angels, etc.

"Men like Michaelangelo, Donatello, Goujon and Thorwaldsen would have left us a better heritage of beautiful motifs in stone and marble, but the classical style columns did not appeal to them as worthy material for their art.

"In the old-style architecture the abacus is so thin as to appear brittle; 'ears' of foliage at the angles give no solidity to it, and a bunch of leaves at the top of the column carrying untold tons of masonry seems almost childish in conception."

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Abstract of an Essay on Flats

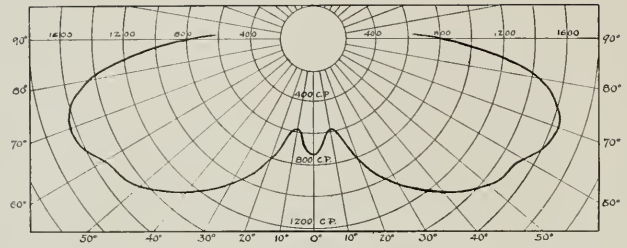
Those of our readers who dwell in "flats" or apartment houses in the large cities of the country cannot fail to appreciate the following abstract of an essay on flats by George Fitch and copyrighted by George M. Adams:

"Flats are an invention whereby people who live in crowded cities can be piled up in layers like pancakes.

"A flat consists of a collection of living rooms all on one floor. A flat building consists of from six to sixty sets of rooms all under one roof and under the over-lordship of a janitor who lives in the basement and doses the furnace with coal on the homeopathic plan. A really expert janitor can run a twelve-flat furnace all winter on a wagon load of coal and can so chill the tenants when they come down to complain that their rooms will seem tropical when they return to them.

"Flats are built of brick, wood, stone, strawboard, felt and tissue paper, the latter being used principally for partitions. An economically built flat building is usually provided with a lightwell which is entirely filled with conversation. By means of this well the occupant of the top flat can hear what the husband of the first floor says when the coffee doesn't suit him, and when the woman in number 2 tells her late returning spouse that he is a brute the women in numbers 1, 3, 4, 5, 6, 7, and 8 quiver with simultaneous indignation.

"Flats have handsome hallways fitted with New Jersey Turkish rugs, and back porches where one may have a garden consisting of a geranium. They are also provided with bathtubs and two kinds of water, cold and not so cold. In the cities, owing to the high price of ground, aldermen and building material, the rooms in a flat are sometimes very small—so small that when the daughter is playing the piano the mother has to wash the dishes gently for fear of splashing on the music—so small that the members of the family have to be measured for the bedrooms as they would for vests, and anyone weighing over 180 pounds has to work himself into the bathroom by means of glove powder and a shoehorn."



DISTRIBUTION OF LIGHT IN A VERTICAL PLANE FROM A 6.6 AMPERE LUMINOUS ARC LAMP.

CHAS. T PHILLIPS, CONSULTING ENGINEER, SAN FRANCISCO.

Fig. 1.

Illumination

By CHARLES T. PHILLIPS, C. E.

In Two Papers—1.

THE infinite possibilities of bettering artificial illumination, as presented by electricity, have created a new type of engineer. The scientific study of the problems of illumination and the importance to general public health in the matter of conservation of vision have led us to a point where not only efficiency and economy must be considered, but the problem of health for the masses must be accorded its proper importance.

This is a day of specialization. An architect no longer tries to master the intricacies of all the special branches of work entering into the designing of a building. He is the master mind in the undertaking, but the heating, ventilation, electrical work, illumination, etc., which are subjects of special study, are now the work of experts in each particular line. The advent of the illuminating engineer as a specialist should thus be hailed with greater delight and relief by the architect than by any other member of the community.

Mural decorations, capitals, columns, mouldings and relief work executed by the master artist, all conceived by daylight, and frequently with a predominating direction of light, may receive an entirely different light treatment under artificial light, and completely reverse the artist's conception. Vast sums of money may be spent in the decoration and equipment of public buildings and expensive homes, yet, such little attention will be given to the proper application of artificial light that, when viewed at night, the effect is not only different, but frequently so grotesque that it is the despair of the artist.

The importance of illuminating engineering as a profession is rapidly growing as the necessity of scientific knowledge in connection with lighting problems is being recognized. No problem of lighting is a simple problem. The public is being educated to the economies that can be obtained by the use of properly designed lighting installations, and is quick to criticise obsolete and inefficient methods.

Physical research work, covering the investigation of the absorbing, reflecting and diffusing properties of matter, the photometrical measurement of light, the study of complex phenomena of color and color sensation, and the production, utilization and effect of luminous energy and attendant radiation, is the foundation upon which the science of illuminating engineering is based.

Each year finds the standard of artificial lighting raised to a higher plane. The introduction of a greater variety of lighting units, reflectors, and systems of application, the solution of difficult problems through scientific investigation and a better knowledge of the underlying principles of illumination have all added their share toward bettering the conditions in the field of artificial lighting.

While some manufacturers are leading in the designing of correct lighting appliances, it would seem from the numerous lighting devices that are being marketed, without rhyme or reason, as far as proper illuminating engineering principles are concerned, that not even the fundamental principles are known.

The advent of the high efficiency lamp must be credited with the rapid advancement in scientific illumination. This includes not only the incandescent lamp, but the many types of high efficiency arc and vapor lamps. When we had only the carbon filament incandescent lamp and the old type of enclosed arc lamp, both of which are now practically obsolete, there was no incentive to better the application of these units, but, with the development of more efficient filaments for the incandescent lamp and the wonderful improvements in other lighting units, the engineering profession awoke to the vast possibilities of the scientific application of these newer lamps. The same can be said of the gas lamp, of which there are a number which possess great merit. The great drawback to the gas lamp has been the lack of some satisfactory method of lighting, but with the newer systems of electric and pilot-light ignition, this objection has been overcome. The fact that a gas lamp has a tendency to vitiate the air may make it objectionable for residence purposes, but, in public buildings, with an adequate ventilating system, the gas lamp should give satisfaction.

From the early days of the pine knot, man has sought to increase the efficiency of his methods of artificial lighting. The striving for perfection and the vast amount of work done in the research laboratories, have made wonderful strides toward the goal of a perfect method of artificial lighting, yet man has not been able to accomplish what Nature has done in the lowly firefly and glowworm. The light emitted from these insects is a form of light without heat, practically 100 per cent of which lies within the range of the visible spectrum.

The business of the illuminating engineer is to produce a given or a required result of illumination at the minimum outlay for the original installation and subsequent maintenance cost.

The training of an illuminating engineer embraces many subjects. A thorough knowledge of the physical sciences is necessary and, not the least, is an understanding of the eye, its structure and characteristics. The eye has been likened to a camera. In a number of respects this is true, although there are more points of difference than of similarity. The eye is not optically perfect, but what it lacks in this respect, it more than compensates for in its enormous range of sensitiveness. The eye adjusts itself to various degrees of light intensity by the automatic expansion and contraction of the iris through which the light is admitted to the eye. If the iris were perfect in its function, looking at bright lights would not be dangerous, for the iris

would shut down to a very small opening. It usually can go no further than 2 mm., however, which is about 2/25 of an inch, in diameter. Under this condition, the retina can be exposed to an excessive amount of light which will result in scotoma, which may last for an indefinite length of time. This form of blindness has been caused by looking directly at an electric arc at short range and also by the filament of the new type of incandescent lamps.

To see objects clearly with a minimum of fatigue, there must be sufficient illumination, but there must not be too much illumination. Bright lights in the field of vision should be avoided as well as flickering lights. Flickering light is harmful, especially when the flicker is so rapid that retinal adaptation cannot follow the fluctuations.

Yellow is the color easiest for the eye to handle. It comes in the middle of the spectrum, and has a wave length that all eyes can easily apprehend. The colors at the end of the spectrum are more difficult. For this reason, along with its low intrinsic brilliancy, the old carbon filament lamp was not objectionable when used with the filament exposed.

The light that reaches the eye directly is not of the slightest use, and, for this reason light sources should, if possible, be kept out of the range of vision.

Bright light is tiresome, regardless of the direction from which it comes to the eye, but is much more tiresome and more exhausting if it comes from unusual directions. Under all normal conditions the light comes from above. The eye is protected from light from above by the eye brows, which project forward over it so that the light does not fall upon the white portion of the eye very strongly. The reason for snow blindness is probably due not only to the great intensity of the light, but largely to the fact that it comes from an unnatural direction.

It is obvious that no appraisal of efficiency in illumination can be complete unless we consider its effect upon the eye. The realization of this is a noteworthy development in illuminating engineering.

We legislate against noises, and yet we compel the public to face dazzling sources of light which offend the eye even more than the uproar does the ears. We are perhaps a long way from the day when irritating lights will be legislated against, but, along with the conservation of natural resources, the conservation of vision will be eventually considered.

The opponents of lighting legislation have claimed that although the object to be attained through the passage of laws regulating lighting is worthy, such laws would not be equitable. We fail to see where the regulation of artificial lighting would work a hardship any more than those laws governing the installation of wires, plumbing, etc. An electrical contractor may install an exposed powerful tungsten lamp directly in front of the unshaded eyes of factory workmen without violating any laws or underwriters' rules, yet such a procedure is a crime against humanity, because it menaces the sight of the workman.

School children are subject to the painful glare of misplaced lamps of high intrinsic brilliancy, and yet, while in some states it is compulsory to have the eyes of school children examined, nothing is done to remedy the source of the majority of eye troubles. The laws that have been framed for the regulation of artificial lighting have been primarily for factories and workshops.

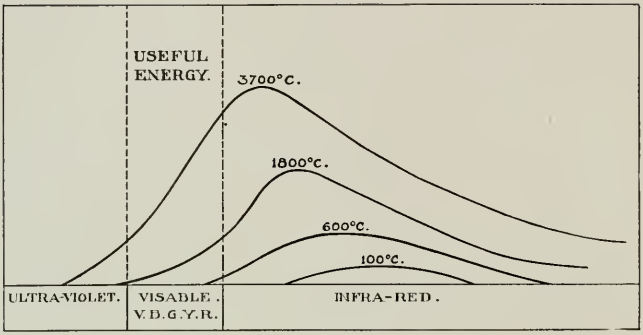
The terms used in connection with illumination are numerous, and a few of those most commonly used are as follows: "Ampere" is the name ap-

plied to the unit expressing the volume of flow of electricity and would correspond to the number of gallons of water flowing through a pipe. "Volt" is the unit of electrical pressure and may be described in the same sense as the pounds pressure in a water system. The "Ohm" is the unit of resistance offered to the passage of an electrical current. The "Watt" is the practical unit of electrical power and is the product obtained by multiplying the volt by the ampere. Ten volts by five amperes would be 50 watts. "Kilowatt" is the commercial unit of power and is 1000 watts, the prefix kilo being the Greek word for thousand. "Kilowatt Hour" is one kilowatt of electricity flowing for one hour. Eight kilowatts flowing for three hours would be twenty-four kilowatt hours. This is the unit by which electricity is usually sold, and is abbreviated K. W. H. In the United States the intensity of a light source is expressed in candle-power. The old unit of candle-power was the British standard candle, which was a spermaceti candle seven-eighths of an inch in diameter, burning at a rate of 120 grains an hour. A sixteen candle-power lamp, for example, was one that radiated sixteen times as much light as the British standard candle. A few years ago a new unit of candle-power was adopted in this country, known as the international standard candle. This is about 1.6 per cent less than the British standard candle. The international standard candle has been also adopted by most of the foreign countries, with the exception of Germany, which still retains a unit known as the hefner, which is 0.9 of one international candle.

"Foot-candle" is the unit of intensity of illumination at a point one foot distant from a source of light of one candle-power. "Lumens" is the unit of light flux and is the quantity of light falling upon an area of one square foot at an intensity of one foot-candle. "Intrinsic Brilliancy" is a measure of the brightness of any light source and is generally measured in candle-power per square inch of surface. The intrinsic brilliancy of the sun at noon is about 800,000 candle-power. An incandescent carbon lamp filament is about 120, the crater of an electric arc 45,000, and the moon, about 3. "Coefficient of Reflection" is the ratio of the intensity of the reflected light to the incident light. Highly polished silver has a coefficient of reflection of .92, a mirror .70 to .85, while black velvet has only .004. The latter is known as the coefficient of diffused reflection. The reflection from polished metals and glass is known as regular reflection, while that from painted surfaces, paper and other materials is diffused reflection.

While a light source is rated in candle-power, it is rather a misleading method of comparison, for the reason that the rating is usually taken at the point of maximum candle-power, which, for an incandescent lamp, is at right angles to the filament and is called the mean horizontal candle-power. For instance, a sixteen candle-power carbon filament lamp gives sixteen candle-power along the horizontal axis, while the candle-power at the tip is only 6.6, which is 41% of the maximum. A tungsten lamp of 20 candle-power gives less than five candle-power at the tip. A distribution of light in the vertical and horizontal planes of a tungsten lamp is illustrated by Fig. 1.

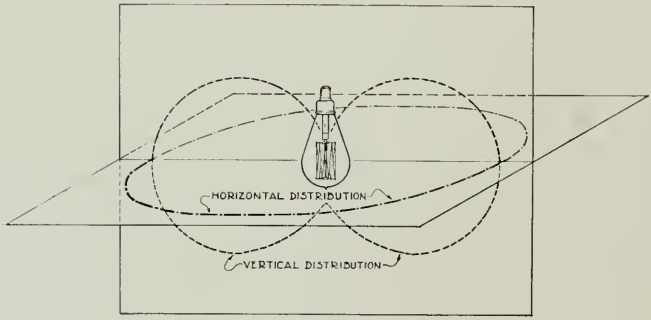
In measuring the output of a lamp the candle-power, as usually expressed, is not of much benefit. The mean spherical candle-power will give a better idea, while the lumens per lamp or per watt is the accepted standard. We can measure in lumens not only the output of the lamps, but also the flux of light through the plane of illumination, and the ratio of the lumens through the plane of illumination to the lumens yielded by the lamps, gives the net efficiency of the installation.



CURVES SHOWING PROPORTIONATE RADIATION OF VARIOUS WAVE LENGTHS AT INDICATED TEMPERATURES OF INCANDESCENT SOLIDS.

Chas. T. Phillips,
Consulting Engineer,
San Francisco.

Fig. 2.



DISTRIBUTION CURVES OF TUNGSTEN LAMP.

Chas T. Phillips
Consulting Engineer

Fig. 3.

In making candle-power tests, an instrument known as a photometer is used, and the sources of light are usually compared with an incandescent lamp which has been seasoned and standardized by laboratories making a specialty of furnishing these lamps, known as secondary standards. Photometers that are used for measuring illumination, instead of the intensity of a source of light, are frequently called illuminometers or luxometers. While the principle is the same, the construction is different for the different types of photometers. All photometric measurements are made by a visual comparison of the source to be measured with some standard, and, as it is impossible for the eye to tell us how many times brighter one light is than another, some method must be used that will make this comparison. Photometry has in late years developed from a simple geometric science to a complex science that involves not alone physics and mathematics, but physiology and psychology as well. Formerly, photometry was almost entirely concerned with the measurement of light of the same color. Recent development of light sources of varied color and new ideas of light distribution have brought changes. The difficulty of comparing the intensity of lights of different colors has resulted in a new form of photometry known as heterochromatic photometry.

While there are numerous lighting units on the market, only a few of the best known will be mentioned. They can be divided into three groups: First, those having a filament of high resistant material, mounted in a glass bulb from which the air has been exhausted and which becomes incandescent upon the passage of an electric current. Second, those which consist of a glass or quartz bulb or tube in which a vapor or gas becomes luminous when a current is impressed upon same. Third, those in which an electric arc is the source of light, burning between two pencils of carbon or other material. The Nernst lamp, of which there are quite a number in use, is still another type.

The first commercial electric lamp belongs to the first group and the filament was of carbon. This is, even today, the best known electric lamp. The next lamp to be developed belongs to the third group, and was known as the open carbon arc lamp. The arc was formed between two carbon pencils and was exposed to the free air, causing a very rapid consumption of the carbons, necessitating the renewal of the carbon electrodes about every six hours. Where this lamp was used for street lighting, burning from ten to twelve hours per night, each lamp had two sets of carbons, the second set automatically cutting in when the first set was consumed. The next improvement was to enclose the carbons of the arc lamp in a small glass globe and to use a better grade of carbons. The enclosure of the carbons prevented an excessive amount of air from reaching the arc; consequently, owing to a lack of oxygen, the carbons were not consumed so rapidly and one set would burn from fifty to one hundred hours.

Twelve or fifteen years ago, an improvement over the original carbon filament incandescent lamp was developed. The filament was subjected to a process which changed its characteristics from those of carbon to those of a metal, and the lamp is known as the metallized filament lamp, the trade name of which is Gem. This lamp is still in use, and, as the efficiency is higher than that of the carbon filament lamp and the price about the same, it should make a desirable substitute for the less efficient lamp. The Gem lamp has an efficiency of about 3 watts per candle-power against 3.5 watts for the untreated carbon filament.

The first of the high efficiency lamps was the tantalum, which belongs to the first group. The filament is of tantalum metal, mounted the same

as the carbon filament lamp, and, due to the higher temperature at which the filament can be worked, the efficiency was raised to a point where the consumption is only two watts per candle-power. This lamp, however, did not give good results on alternating current, owing to a rapid deterioration of the filament, the life being only about half as long as when used on direct current. The success obtained from an efficiency standpoint, by the use of tantalum for incandescent lamp filaments, led to further research and experimenting with other rare metals. A very material advance was made in the use of filaments of tungsten metal, a material particularly suited for this purpose, by reason of the high fusing point—about 3050° C. These lamps, of American manufacture, the trade name being Mazda, are the acme of perfection in the field of incandescent lamps. Their efficiency is the highest yet obtained for incandescent lamps, being only 1.25 watts per candle-power and even better in the large sizes. Their performance is the same on both alternating and direct current, and the objectionable features found in the earlier types of this lamp have been entirely eliminated.

A new type of metallic-filament incandescent lamp is being developed, which, it is claimed, will operate at the low specific consumption of 0.5 watts per candle-power. This is less than half of that required for the best incandescent lamps now available. This new lamp contains a special shaped tungsten filament and the bulb is filled with an inert gas, such as nitrogen, at a pressure of about one atmosphere.

The highest efficiency of late types of incandescent lamps is entirely due to the ability of the filament to withstand a high temperature. A clear idea of the relation of the temperature of an incandescent body to efficiency of light generation may be obtained by reference to Fig. 2. At a temperature of 100° C. the wave lengths have not the power to stimulate the optic nerves, although certain nerves near the skin are affected and a sensation of heat is felt. At 600° C. a larger amount of energy is radiated, and some of the shorter waves are capable of exciting the optic nerves and we have the sensation of light. At a still higher temperature there are short waves generated which are incapable of affecting either the optic nerves or those near the skin, but are very active in producing chemical changes. This is shown on Fig. 2 at a temperature of 3700° C. Very high temperatures are not desirable, due to the increased number of chemical waves which have a harmful effect on human beings and a bleaching effect upon colored materials.

In the second group belong the mercury-vapor lamp, the Moore tube and others of a similar nature. The great disadvantage of the mercury-vapor lamp has been its color. The lack of proper proportions of red and yellow rays gives the light a ghastly appearance, and makes it valueless where appreciation of color value is required. Several means have been employed to improve this defect, but, until recently, none of them have proven a success. The use of cadmium amalgam in place of mercury, and a quartz instead of a glass tube, has finally achieved the desired results; besides, the efficiency has been increased in the larger sizes, the consumption being 0.18 watts per candle.

Numerous developments have been made in recent years in the type of lamp mentioned in the third group. The luminous arc and the flaming arc are perhaps the most noteworthy. The luminous arc lamp gives a distribution and quality of light very superior to the early type of arc lamps. The electrodes used in this lamp are different from those in other forms of arc lamps heretofore used. The upper electrode is composed of a

solid copper rod sheathed by a thin iron tube. The lower electrode is of magnetite. This lamp is also called the magnetite arc lamp owing to the material from which the lower electrode is made. The life of the upper electrode is from 2,000 to 8,000 hours, and the lower, from 120 to 150 hours, depending on the current adjustment. In the carbon arc lamps, the crater of the carbon is the source of the greater portion of the light, while in the luminous arc, the arc between the electrodes, which is about 9/16 inches long, is luminous throughout its length, thus furnishing the majority of the light rays. The light distribution from a luminous arc lamp is shown by Fig. 3. Carbon arc lamps divide themselves into three classes, those that use solid carbons, cored carbons and flaming-arc carbons. The first two classes depend essentially, for their light producing, upon the continuous-spectrum radiation of highly heated carbon in the positive crater. The only purpose served by the cored carbons is the centralization of the arc. In the third class, however, the arc itself yields the principal share of emitted light. The most efficient lamp on the market today, in current consumption per candle-power, is the flame arc lamp. The first of this type of lamp used in this country was imported from Europe, and, although it had much to recommend it from an illuminating point of view, the lamp was so poorly constructed mechanically that it was soon looked upon with suspicion by prospective buyers. While the European lamp still retains its weak points, the American-made lamps are as satisfactory and reliable as any other type of arc lamp, and are giving excellent service. The characteristics of this lamp are high efficiency, the maximum light in the lower hemisphere, the warm and pleasing quality of the light, which is of a brilliant golden yellow, and the fact that the color of the light can be changed by impregnating the carbon electrodes with chemicals.

(Concluded in the February Number.)

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Architects' Competition for $350,000 Fountain

ACTING under authority granted by the Common Council of the City of Detroit, Michigan, by resolutions of November 25, 1913, the Detroit City Plan and Improvement Commission announces that it will institute a competition for the selection of an architect to design and supervise the construction of a fountain to be erected in Belle Isle Park, City of Detroit, to be known as the James Scott Fountain. The sum available for the work amounts to $350,000.

The competition will be conducted in accordance with the regulations of the American Institute of Architects. It will be in two stages. The first stage will be open to all architects resident in the United States who from their experience and training are, in the opinion of the committee, capable of carrying out this important work. The second stage of the competition will be limited to not more than ten competitors, at least six of whom will be chosen by a jury from those competing in the first stage. The competitors in the second stage competition will receive compensation.

The Commission has employed as professional adviser Professor E. J. A. Duquesne of Harvard University—architect of the French government—and will be assisted by him in the conduct of the competition and choice of competitors.

The Commission invites architects who desire to compete to send their names, addresses and qualifications as to experience and training to Professor E. J. A. Duquesne, Robinson Hall, Harvard University, Cambridge, Mass., before noon, February 1, 1914.

The Value of Paint for Structural Steel

By A. H. SABIN.

The principal objection to the use of steel as a structural material is that its life under ordinary conditions is comparatively short. Although engineers have for years endeavored to obtain a paint which would adhere to the steel and would prevent, or at least greatly retard, corrosion, it cannot be said that the problem has been satisfactorily solved. Paint makers have turned from one material to another, and it has been claimed for each new brand that a satisfactory paint has at last been discovered. It has only been within the last few years that engineers have been brought to any appreciation of the fact that it would be necessary to learn more about the properties of paint materials and the fundamental principles of paint making before much progress could be expected.

Whatever progress has been made is due, not to the discovery of new paint materials, but to a better understanding of those materials which have been commonly used. Progress has been made in our knowledge of linseed oil and of red lead, the two important ingredients of structural steel paint. Engineers are also realizing that time spent in the preparation of the surface to be painted and in applying the paint is a good investment. The following paper by Mr. A. H. Sabin indicates recent progress in paint making and discusses the properties of the ingredients of paints for structural steel.—Editor.

MUCH has been written and much has been done relative to the protection of steel; but improvement has been slow, progress being made step by step. Some years ago Mr. G. W. Thompson attempted to classify pigments, as to their relation with iron, by suspending them in water and immersing pieces of iron or steel in these mixtures. The results were somewhat surprising; some of the pigments which common experience approved seemed to increase corrosion in this condition, and others, known to be useless in protective paints, seemed to be much better for preventing it. Lampblack, for instance, was the worst in provoking corrosion, and white zinc or pulverized chalk prevented it. This was probably due to the fact that lampblack contains, condensed on the surface of its particles, considerable carbonic acid, which is the most generally active agent in the corrosion of iron, while white zinc and chalk are basic substances by which iron is not rusted; however, the carbonic acid in lampblack is displaced by grinding in oil, and the well-known lack of durability in paints made of white zinc and chalk prevents their good qualities from coming into action.

So great is the need of more knowledge as to the value of pigments in paints, and their mode of action, that nothing which promises new information is neglected. A committee of five chemists from different parts of the United States, with the approval of the Society for Testing Materials, made a series of tests of the principal pigments, and of some other substances, on steel immersed in water; and, as was to be expected, arrived at substantially concordant results. These results, as has been stated, were of no value from the standpoint of the paint maker, being inconsistent with the known value of the pigments when ground in oil or varnish. When the report was published, however, the pigments were classified, according to their water value, into three groups, namely, inhibitors, indeterminates and stimulators. This was the origin of the use of these now well-known words in paint terminology. It was expressly stated in the report that this was a classification as regards water only; but the names were so convenient and so tempting that those not familiar with the subject, and also many who saw their value for advertising purposes (two quite distinct classes), put them into common use to classify pigments in oil. It is obvious that any classification of pigments in oil should be based on their behavior in oil, and if, as must be conceded, this is radically

different from water tests, the latter should not be regarded. All this investigation began some years ago; meanwhile numerous young men, mostly students working under the supervision of their teachers, have made brief and generally inconclusive studies of paints, and almost without exception have used these indefinite terms, inhibitors and stimulators. Patents have even been taken out—which, in the writer's opinion, are not only worthless but invalid—covering the use of old and well-known pigments. What is worse, every maker of a paint nostrum assures his hearers or readers that his particular paint absolutely inhibits rust, and that everything else stimulates it. This is the whole history of this jargon about inhibition and stimulation; it never had any particular value to the consumer, and it is generally used to mislead him.

It is obvious that in a good paint the pigment particles are enveloped in a film of oil; they do not come in contact with the iron; if they did, the paint would peel off, for no dry pigment adheres well to metal. Steel rusts because air and moisture act on it; and paints are used to keep air and moisture from it. They do not inhibit rusting, except as they inhibit the cause of it.

The important practical question is whether paints have been or can be improved as to being non-porous and durable. This is essentially dependent on the relation between the pigment and the oil. As to the true nature of this relation, very little is known; but something is known about its visible manifestations. It is known, for instance, that one pound of dry red lead mixed with one-quarter pound of oil makes a paint of ordinary consistency, and one pound of dry lampblack requires at least six or eight pounds of oil, say, thirty times as much, or making allowance for difference in density, six times as much, as the red lead. Similarly, one pound of white zinc takes twice as much oil to make a paint as one pound of white lead; and white lead takes nearly twice as much as red lead. These are things we know; but we have no idea why they are so. Again, red lead, which is an oxide of lead, makes an excellent paint for iron; oxide of iron is neither very good nor very bad; oxide of manganese is bad. Our knowledge of paints is as yet largely empirical. Where we are gaining is in more general appreciation of the value of the proper application of paint, better preparation of surface, more confidence in good paint rightly used, and in the better preparation of paint materials. For instance, in the older books, and until about twenty years ago, we find analysis of red lead showing as low as 55 per cent of true red lead, with 45 per cent of litharge. Red lead is made from litharge, and the presence of the latter is not a sign of adulteration, but of incomplete conversion. At the same time other samples showed as high as 80 per cent of true red lead. As is well known, there was much difference of opinion in those days as to the value of red lead as a paint for iron; though most users liked it, some thought it poor stuff. It is now known that its value depends on the quantity of red lead it contains. Coarse red lead always contains litharge, because the litharge in the middle of a large particle is never oxidized. It was observed that the finer the red lead, the better it was, and so a demand arose which forced the manufacturers to make higher grades; now they are grinding their litharge to an impalpable powder before roasting it, with the result that 94 per cent of true red lead has been on the market for some years. Then an unexpected fact was developed. The old red lead when mixed with oil would set in a day or so—often in a few hours—into a cement, just like plaster of Paris and water; this tendency made it work with difficulty and unevenly in application, and its coarseness gave it a tendency

to run; but the new, or high-grade, article is inactive to oil, and brushes out smoothly like a house paint. This enables the painter to cover 50 per cent more surface with the same quantity and still get a coating having a uniform thickness which gives more protection than the thin portions of the paint formerly used. This secures greater economy, even at a slightly greater cost per gallon; and this is an economy not only in the cost of the paint, but in the labor, because the paint works more easily, and a man can cover more surface in a day; it also requires less skill, and therefore a less highly paid man, to do good work. For the last year or two red lead ground in pure linseed oil has been offered to the trade as a paste ready to be thinned with more oil; such a paste keeps for a year or more, or indefinitely as far as known, like white lead paste. Its use saves time and waste in mixing, and, being ground through a mill, the mixture is perfect, which is not the case with hand-mixing; and, as it avoids the presence of a dusty pigment, it is more sanitary.

The only serious objection to the use of such red lead is that it dries more slowly than the other kinds. This can be obviated, however, by the use of a little japan drier. There is a well-founded prejudice against the use of excessive quantities of drier in any paint; but it should be remembered that red lead paint mixed in the (standard) proportion of 28 pounds of pigment to one gallon of oil, contains 20¼ pounds of pigment per gallon of mixed paint. If this pigment contains 15 per cent of litharge, it has three pounds of litharge per gallon. Now, ordinary, good, lead japan driers, or lead and manganese driers of approved quality, contain the equivalent of one pound of litharge in about three gallons of drier, and three pounds of litharge will make eight or ten gallons of drier. To make one gallon of mixed 94 per cent red lead paint dry requires only one pint of drier; the rest is excess. It is much safer to add the desired quantity of drier. It may be asked why the litharge in the 94 per cent red lead is not more active; it is probably because, when the peroxidation of the lead has been carried so nearly to completion, the particles of litharge are enveloped so completely by a dense coating of true red lead that the oil does not reach them. This is obviously not the case with the commoner and less thoroughly oxidized pigment.

It has sometimes been suggested, by those not very familiar with the chemical questions involved, that the litharge is the essentially valuable part of the paint, and that the red lead is only an inert extender. This is not so. The whole history of the subject shows that the improvement in red lead for paint during the last twenty-five years has been made by reducing the litharge contained in it; litharge alone, or used with other pigments, has not been satisfactory, though orange mineral, which is red lead free from litharge, is most excellent, and would be used if its cost were not so great. Further progress will undoubtedly produce red lead with a lower percentage of the protoxide; in fact, the 94 per cent red lead now in the market usually contains much more than 94 per cent of true red lead.

Progress has also been made in our knowledge of linseed oil. Within a few months the American Society for Testing Materials has adopted specifications for North American raw linseed oil, which is of better quality than that made from South American seed. These specifications are the result of a great deal of work by many of the best oil chemists, and it is now possible for any good analyst to tell whether or not an oil is pure and good. Methods of paint analysis are in general being standardized; and a vast amount of work is going on in Germany and England as well as in

the United States, on the chemistry and nature of drying oils. At present linseed oil has adulterants, but no substitute; China wood oil is a valuable drying oil, more valuable for some purposes than any other, but, as an oil for ordinary paints, it is used, as far as the writer knows, only to cover up the use of non-drying oils which must be regarded as adulterants. At present prices, it is not likely to be used even in this way. Fish oil is used to some extent, as it always has been, in paint for roofs and smoke-stacks, but one should not be disturbed by talk about the "newer paint oils," for, except China wood oil, there are none.

In closing, it may be well to mention that the committee appointed by the American Society for Testing Materials has made a final report on the condition of the paints on the Havre de Grace Bridge. As is well known, this bridge was painted six years ago by a committee of that society, which committee included several members of the American Society of Civil Engineers. This report describes three of the paints as excellent; two of these were straight red lead in oil, and the third was red lead, with about 15 per cent of a pulverized silicate added, in oil, the red lead being about 98 per cent true red lead. Nine other paints, of varying composition, are reported as affording generally effective protection to the structure. As all these paints were carefully applied, it is fair to conclude that the durability of any good paint may be increased one-half, and probably doubled, by proper care in its use as compared with average practice. It is only by continually reiterating this fact that we shall ever secure the most elementary and fundamental requirement for the economical treatment of structural steel.

*

* *

This Was a Successful Architectural Competition

ARCHITECTS all over the country have manifested keen interest in following the erection of the municipal group at Springfield, Mass., because the plans for the $1,900,000 project were accepted by competition according to the rules of the American Institute of Architects. The designers, Messrs. Pell and Corbett of New York, were selected by a commission of which Prof. Warren P. Laird of the University of Pennsylvania was the architectural adviser. The group of buildings, consisting of an auditorium with a seating capacity of 4,000, the campanile with a chime of twelve bells, and the Administration building, was formally dedicated last month, and among those who participated in the exercises was Mr. F. Livingston Pell of New York, one of the architects of the group. He said in substance:

It is not often in the career of an architect that he is given the opportunity of designing such buildings as we are dedicating tonight. The object of the architect, it is often said, is to get the job. We like, however, to accept a higher standard, that set by Prof. Ware of Columbia, namely, to build beautiful buildings. Few of you realize the amount of work and minute attention that is involved in the evolution from the plan to completion of buildings of the character of this municipal group. If you knew of the care we take in our work you would understand why it is that the erection of a building like this means to us almost as much as the development of a child whom you have brought into the world and educated would mean to you.

It is rarely that we have the opportunity of working in a town where the taste and appreciation of architecture is as high as it is in Springfield, so that we are permitted to do good work. In this respect you are co-architects with us. As a result of our work togther you have a home for your municipal government that is not equaled in New England.

You know the history of these buildings in the course of their construction. At first they were referred to as "Mr. Pratt's twins," and the tower as a nursing bottle placed at a sufficient distance from each one. I assure you that the architects and the building commission had no race suicide idea in mind when they planned the group.

Doubt was expressed as to the necessity of a municipal auditorium. Probably the same doubt was expressed by your forefathers as to the advisability of having a town hall. The auditorium has proved its usefulness already. In the short time since last spring that it has been completed, it has been in almost constant use, and had a reasonable rental been charged for it the building would have proved a commercial success. One of the largest taxpayers in this city said to me today: "I can calculate to within a few dollars the share I have paid toward the erection of the Campanile, but when I see the sunlight and clouds upon it late in the afternoon, I feel that I am repaid for all it has cost me as a citizen of Springfield."

*
* *

Local Materials and Labor in Connection With Federal Work

THERE has been considerable correspondence between various Home Industry organizations of the Pacific Coast and the Treasury Department in Washington, with the idea of persuading the government architect to favor local materials when a Federal building is to be erected in the vicinity of such materials. The agitation has brought forth the following emphatic declaration from Secretary McAdoo, and it is probably final insofar as the Government is concerned:

To whom it may concern:

The Department is frequently requested to include in its specifications for the construction, etc., of Federal buildings the requirement that the successful bidder for the work shall use a particular material, fixture, appliance, or method, or that certain of the materials and labor to be used in the construction of the buildings must be obtained in the localities in which they are to be erected. The Department is compelled to deny these requests for the following reasons:

The law requires that proposals for the construction of Federal buildings shall be solicited by public advertisement unless the public exigencies require the immediate delivery of the articles or performance of the services sought to be obtained. The obvious purpose of the law is to secure through broad competition the lowest terms obtainable. This object would be defeated if bidders were restricted to the products of any particular state or locality or if the bidding were similarly restricted to residents of any particular section of the country.

The Department always declines to indicate by name or brand the particular materials, fixtures, appliances, methods, etc., to be used, but specifies the grade of both materials and labor. Bidders are free to procure these anywhere obtainable, provided they meet the specification's requirements.

Nothing in the specifications for the different buildings prevents local contractors from bidding on the work. Nor is there ever anything in the Department's specifications which would prohibit a successful bidder residing elsewhere from obtaining his materials or labor from the manufacturers or dealers and the artisans of the locality in which the proposed building is situated, provided the specification requirements, as to quality, etc., are met.

The Department is always gratified, whenever local materials and labor are found to answer its requirements, but it can not undertake to restrict competition by limiting bidders to local materials and labor. Whenever the Department has information concerning an available local stone or face brick, it endeavors to draw its specifications so that proposals may be submitted on these materials, but can not do so to the exclusion of materials of the same class produced elsewhere.

Those interested in the development of local industries or the employment of local labor are always free to bring the same to the attention of the successful bidder for a particular Federal building. Whenever materials, etc., the use of which it is sought to have the Department specify or require, are submitted for approval by a contractor for a Federal building, they are invariably given due consideration.

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Next Convention City—Seattle.

Fixture Contract

The Fink and Schindler Company have been awarded the contract for the interior fixtures and fittings for the Bank of San Leandro, including the mahogany woodwork, marble and bronze work. Cost, $9,290. W. H. Weeks, architect.

Building a House and a Town

"How to Build a House and a Town" was the subject of a University extension lecture recently given in Berkeley by Architect William C. Hays, assistant professor of architecture in the University of California.

"Scientific management is coming to be applied in household affairs as well as in business," said Professor Hays. "The kitchen is a laboratory and its arrangement and equipment should save all lost motion, from the receipt of the raw material to the delivery of the finished product. Many gas ranges, for instance, are still designed as if a heavy bucket of coal were to be lifted, and so the cook is obliged to bend over, instead of having oven and fire set at a comfortable level.

"The tailor-made closet is another great modern improvement, with its rods for hanging coats and trousers, its movable trays for shirts, its provision for light and ventilation, and its economical use of space.

"The sleeping porch has evolved from the ancient horror of the curtained bed set in the old-time bedroom niche. Modern plumbing has as much revolutionized housekeeping as the invention of the steel frame has altered the aspect of cities.

"Beauty is of immense value to a community, commercially as well as in the psychological dividends which it yields its inhabitants and its visitors. Every man should plan his house so as to enhance the beauty of his town. There should be harmony in color, in materials, in the slopes of the roofs, in tree planting, and in gardening—harmony, but not monotony.

"There is immense responsibility laid on those who have to do with civic affairs and have opportunity to make their home town beautiful and likable. Most California towns can look forward to a population vastly greater than they at present have. The obligation is upon them to plan wisely for the future, to foresee future needs in the way of transportation, traffic, streets, proper development of particular neighborhoods for residence, for business, for transportation purposes and for manufacturing. Now while land is vastly cheaper than it will be a few years from now, communities should see to it that they provide themselves amply with space for a civic center, for schools and school gardens, for agricultural high schools, for parks, for recreation centers, and for a public playground within half a mile of every resident of the city. As congestion grows these playgrounds become enormously valuable in promoting health, well-being and character."

Fixture Contract

The Fink & Schindler Company have been awarded the contract for the interior fixtures and fittings for Robbins' jewelry store, 147 Geary street, San Francisco, at a cost of $3,750.

The Decoration of Oakland's City Hall

A mural painting by Maxfield Parrish for the end of the Council chamber in Oakland's new City Hall, an allegorical group of statuary above the main entrance to the building, and a great bronze tablet at the head of the main stairway in the rotunda, have been suggested as necessary to the completion of the building by Henry Hornbostle, the architect who designed the structure. During a recent visit to California Mr. Hornbostle said:

> No spirit of economy should be permitted to interfere with the completion and finishing of this building. Oakland's City Hall has no rival in the world and nothing should stand in the way of making its appointments compatible with the structure.
>
> Some noted painter of mural decorations should be commissioned to paint a canvas for the wall of the Council chamber. Such a painting from the brush of Maxfield Parrish would be worth a hundred fold its cost as an advertising medium for Oakland throughout the world. An allegorical group illustrative of the ambition and destiny of the city, carved by a master, should adorn the main entrance. A bronze tablet of artistic design should be placed at the head of the stairway in the rotunda.
>
> To the end that the best talent in the country might be called on for such work, it should be thrown open to competition.

Cass Gilbert's Latest Building

Detroit's new $1,000,000 library will be constructed from a design submitted to the Public Library Commission by Cass Gilbert of New York City, whose plan recently was adjudged by a jury of experts to be the best of six plans submitted by architects of New York and Detroit. Fireproof construction will prevail throughout, and the exterior will be executed in cut stone work. Interior arrangements are designed along the simplest possible lines, and there will be ample aisles and a great array of modern conveniences. Simple classical lines will predominate in the new structure, which is to comprise two stories and a mezzanine floor. The approximate bulk of the building will be 1,700,000 cubic feet. Capacity for 500,000 volumes will be contained in the stack room, which is to be well lighted by natural light. Mr. Gilbert will receive six per cent of the $1,000,000 appropriation for the library.

Architects Should Travel

Architect Hugh Braunton of the firm of Braunton & Leibert, Vancouver, B. C., has left for the eastern states on a business and pleasure trip.

Mr. Braunton contends that in order to do justice to oneself in the profession it has become absolutely essential for the architect to travel, thereby personally familiarizing himself with new ideas, especially when improvements follow one another as rapidly as they do in the present age.

Personal

Oscar Mohr, architect, member of the Dolphin Rowing Club and designer of the aquatic park at the foot of Van Ness avenue, and Miss Ruth Brown of San Rafael were married Christmas week by Judge Graham at the judge's residence, 2368 Vallejo street, San Francisco.

A co-partnership has been formed by Wilbur David Cook, landscape architect, F. A. S. L. A., and Messrs. R. S. Rankin and R. F. Wyckoff, civil and landscape engineers, with offices in the Marsh-Strong building, Los Angeles. The firm will specialize in landscape architecture and engineering, and the scientific development of land. Members of the firm have had fifteen years' active practice in the East and seven years on the Pacific Coast.

W. J .Mathews, architect, of Oakland, has been made superintendent of construction in connection with the new Oakland Auditorium.

Robert Morgeneier, architect, of Oakland, has formed a connection with the West Coast Showcase & Fixture Company, a newly organized firm capitalized at $100,000 and having headquarters at Berkeley. F. T. Russell of Oakland is president and Mr. Morgeneier is secretary and treasurer. In addition to superintending the mechanical work for the new company, Mr. Morgeneier will continue his practice as before.

Architects Eager & Eager of Los Angeles have dissolved partnership by mutual consent. A. W. Eager will continue the present office in the Story building and F. O. Eager will engage in business independently.

Ernest J. Kump, formerly of San Francisco, has opened architectural offices at No. 227 Rowell Building, Fresno. Prior to coming to San Francisco, where he supervised the construction of the West Coast Iron Company's plant at Sixteenth and Rhode Island streets, Mr. Kump was located in the southern part of the San Joaquin valley.

Club Elects New Officers

At the semi-annual business meeting of the San Francisco Architectural Club, held January 7, 1914, the following officers were elected: President, George Greenwood; vice-president, Charles P. Weeks; secretary, Albert R. Williams; Treasurer, William D. Sherman; directors, Henry A. Thomsen and James A. Magee. William A. Garren was appointed to fill the unexpired term of George Greenwood.

Milk-Bottle Architecture

We don't know what the art-loving architects think of this. We imagine we hear their unanimous groan of disapproval come gurgling down from their ateliers up under the roofs—like sour milk running from a huge bottle.

Probably the advertising boys like it better.

Anyway, there it is. Two of them on the new building of one of Indianapolis' leading milk companies. The two front corners of their building are giant milk bottles built of white enameled brick. They measure 52 feet in height and have a diameter of 22 feet. The proportions are exactly those of a standard quart bottle.

Evidently they overlooked a bet in not using deep yellow brick for the upper sections—to indicate the color of cream.

The Berkeley Campanile

(Springfield Republican.)

A 300-foot campanile, to cost $200,000, is being constructed at Berkeley for the University of California, the gift of Mrs. Jane K. Sather of Oakland, who also gave $25,000 for a chime of bells. It will make a fine landmark, visible from ships entering the Golden Gate and from all the cities clustering about the bay. The first steel column was swung into place last week, and the tower will be done in 1915. How much simpler things would have been for Giotto and the other old builders, if they had enjoyed the advantage of steel construction! Their first problem was to make a tower stand up, a problem which can hardly be said to exist for the modern builder. When it comes to looks, something is to be said for Giotto.

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STATE BOARD SHOULD GET BUSY

There is plenty of work for the California State Board of Architecture, Northern Division, if reports of the increase in the number of no-certificated architects are to be relied upon. It seems that the dearth of business in many of the architects' offices and the consequent laying off of draftsmen have driven the latter to desperation, and they have been taking work for little or nothing. Of course this hurts the profession not a little, and those who hold certificates from the State naturally are entitled to some protection. Therefore it is up to the State Board to get busy just as the State Medical Board has been active the past month in ridding San Francisco of quack doctors. At a recent meeting of the San Francisco Chapter of the American Institute of Architects, the following resolution was offered by Mr. T. J. Walsh, and the fact that it was unanimously adopted indicates that the members of the profession appreciate the seriousness of the situation:

"Whereas, the Committee of Publicity has for a period of two years called the attention of the Chapter to the fact that by reason of indifference and lack of interest the work that should go to the architectural profession is now being done by contractors and others, with the result that many are losing business and many draftsmen are idle,

"Resolved, that the members of this Chapter who are members of the State Board of Architecture, together with our President, wake up and take energetic steps to prosecute persons who are practicing architecture without a license, and, if necessary, to employ special counsel."

THE VALUE OF AUTOMATIC SPRINKLERS

Hardly a week passes in the winter season that we do not read in the newspaper reports of fires of how the automatic sprinkler demonstrated its efficiency. A few days ago one of the dailies reported the discharge of a watchman in a big Eastern factory. It seems his attention was attracted to a flood

San Francisco Society of Architects

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The constitution and by-laws of the society are substantially those of the American Institute of Architects.

The society has voted not to increase its membership beyond the present number for an indefinite period. When the society decides to withdraw this temporary restriction, then, in accordance with the by-laws, any practicing architect or any architect engaged in architectural education or any architectural draftsman, over thirty years of age, will be admitted to membership if he can submit proofs of his honorable personal and professional standing. The applicant for membership will require the approval of all the members, to be elected. The annual meeting takes place in June.

of water pouring down from an upper floor. He could see no fire and assumed that the sprinklers had sprung a leak. So he turned off the water. Ten minutes later the building was a mass of flames. After the fire the chief of the department declared that had the sprinklers been left alone the fire would have been extinguished with nominal loss.

Several weeks ago the Modesto Theater was badly damaged by fire. Doubtless the structure would have been totally destroyed but for the automatic sprinklers. Here is what the Modesto Herald said about the sprinkler service:

> One remarkable fact revealed is that, contrary to the general idea, the upper part of the stage and the loft and equipment for handling scenery, as well as most of the scenery, was the only portion of the theater that escaped the flames, thanks to the automatic sprinkler system that threw a fine spray from the top of the loft all during the fire, protecting the wooden framework and the equipment.
>
> As there is a considerable amount of inflammable material in this loft, it can be seen that without the work of these sprinklers the loft would have been a raging volcano and it would have been difficult to save adjoining buildings. While the scenery itself is rendered useless by the water, the wooden frames can be used again.

It is a well-known fact that there is a great difference in the results obtained from sprinklers at time of fire, and owners should not neglect to have the system occasionally looked after by a competent workman. The real efficiency of a sprinkler equipment is directly dependent upon its readiness to serve at time of emergency, or fire, and there are a great many things which may prevent the proper operation of a system and interrupt the protection. Conditions in any plant are constantly changing from time to time, and these changes are not properly looked after by owners of equipments for several reasons; one being that they are not any too familiar with such equipment, and another that their business requires all of their attention.

In the East the American District Telegraph Company maintains an automatic signal system which keeps track of the troubles that occur in sprinkler equipments. The general idea of the system is to supervise from a central station all the vital points of a sprinkler equipment, and in event of trouble to notify the owner so that proper repairs may be immediately made. The thousands of dollars invested in equipments may be absolutely useless if a gate valve is closed, which cuts off the supply, or if the tanks are empty when needed.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

Concrete Roads in Pierce County, Washington

By M. ROY THOMPSON*

PIERCE COUNTY, Washington, laid during 1913 a total of 21 miles of concrete pavement, making it the banner county of Washington in this respect. This fact, coupled with my tour of inspection of concrete roads over the greater part of the United States, extending from the Pacific to the Atlantic Coast, has given me information which may be of help to other engineers or road builders who are trying to make the dollars intrusted to them go as far as they will. I shall endeavor to tell as accurately as possible what helpful things I learned.

Road pavement, like every other form of construction, is primarily an economic problem.

The need of any pavement at all is to cheapen the cost of transportation of the necessities of life to and from the market. It is probably safe to say that a horse can draw five times as heavy a load on a smooth, hard surface as on an ordinary dirt road.

The selection of the type of pavement to lay is also an economic problem, resolving itself into a consideration of the "first cost," "durability" or life of the pavement, relative cost of operation or "resistance to traffic," and expense of "maintenance."

As regards the "first cost," the Engineering News gives the following averages obtained from several hundred municipalities: Brick, $1.82 per square yard; asphalt, or bituminous pavements, $2.06 per square yard, while the concrete pavements I have examined cost an average of about $1.00 per square yard. Pierce county's one-course concrete pavements cost from 76 cents to 86 cents per square yard, or less than half the average cost of the other standard forms of pavement.

The "durability" of the different pavements is the next element to consider.

The Ohio State highway department, in Bulletins 12, 13 and 15, describes extensive experiments as to the relative amount of wear on different pavements on the Nelson avenue experimental road near Columbus, from December 22, 1909, to November 11, 1911. The averages obtained from this trial were as follows, the figures indicating inches of wear:

Standard asphalt, .84; pioneer asphalt, .53; Tarvia X, .60; Tarvia B, .53; Indian asphalt, .55; Fairfield asphalt, .70; rock asphalt, .91; limestone concrete, .38; and gravel concrete, .19 inches wear. No brick pavement was included in this experiment.

In Detroit at the American Road Congress a "paving determinator" was used to test the relative wear of sample brick and concrete pavements. This consisted of two iron-bound wheels each weighing 400 pounds traveling around a circle, each wheel bearing five plungers with steel horseshoes attached striking the pavement with 150-pound blows. I observed this test for a period of five days, but did not make measurements of the wear on each pavement. It appeared to the eye, however, that the brick was wearing slightly less than the concrete. The sample section of concrete was only five weeks old and the brick seemed to be particularly well selected, well vitrified and uniform. A report on an earlier test with the same determinator in 1912 made under the auspices of the Department of Public Works, Detroit, showed a uniform wear of one-fourth inch on the concrete surface, one inch on some of the granite blocks, and from two inches to three inches on some sections of the brick pavement.

The only two forces a pavement is called upon to withstand from traffic are stress and abrasion. The pavement that will best resist these forces will have the greatest durability. Stress varies as the weight of each load, while abrasion varies with the amount of traffic. It is evident that a compact, unyielding subgrade will greatly increase the compressive strength of a paved roadway. A thin pavement over an unyielding subgrade will sustain

*County Engineer, Tacoma, Pierce county, Washington. Abstract of address delivered before the seventh annual convention of the County Engineers' Association of the State of Washington, North Yakima, November 18-19, 1913.

a greater weight without fracture than a much thicker one over a mushy subgrade. The thickness of a pavement, therefore, depends greatly upon the character of its foundation, and I think it is safe to say that whatever outlay it may require to subdrain and thoroughly compact a roadbed will be more than saved in the lessened thickness of pavement required to resist a given weight of traffic.

In Pierce county we have required all subgrades to be thoroughly drained and rolled before paving in order to form a safe support for the five-inch pavement adopted in our specifications.

As for the best type of paving material to withstand compressive stresses, there is only one answer. We do not build our skyscrapers or steel bridges upon asphalt or brick foundations. Concrete is preeminently the most economical material known for this purpose. And we may safely conclude that concrete is most suitable to withstand the similar compressive stress of traffic.

As to the other destructive force exerted by traffic, "abrasion," it is a fact that abrasion varies with the amount of traffic and that aside from the disintegration of the natural or chemical elements, any surfacing material will last indefinitely if subjected to no traffic, and the life of the different types of pavements having equal compressive resistance will vary strictly with the different amounts of traffic punishment required to wear them out. On a resilient pavement like asphalt the destructive forces of traffic are "let down easy," and the sand cushion in a brick pavement tends also to absorb some of the shocks of traffic. Concrete, however, being a rigid material, must make up in "toughness" what it lacks in resiliency. Here then appears to be the element of vital importance in a concrete pavement. The problem to determine then is whether a degree of "toughness" can be obtained in concrete that will withstand the pounding and grinding forces of traffic relatively as well as the other types of pavement, that is, in proportion to original cost and expense of maintenance.

To a certain degree this problem is still a matter of experiment. There are no concrete pavements old enough to have demonstrated the full life of the pavement, and furthermore, the oldest concrete roads were not constructed with the modern and careful methods under which some of them are now being laid.

One important thing to bear in mind in selecting concrete as a pavement is the fact that it may be surfaced at any time with brick, asphalt or a thin bituminous top, and hence money expended in such "experimental" work is not wasted. Furthermore the builder of concrete roads, even if they must be topped later with another surface, serves twice as many farmers, with the double mileage, as could be accommodated by the laying of a form of pavement twice as expensive.

I have mentioned something about the experimental tests of concrete against abrasion. During my trip I visited Lynn, Mass., where about seven miles of residence and business streets are paved with concrete. The oldest of these was laid in 1907, and seemed remarkably free from cracks and uniformly smooth on the surface. No expansion joints are used in any of Lynn's concrete pavements, the process of laying the concrete being by the penetration or Hassam method which makes it difficult to include expansion joints.

The next oldest concrete roads I saw were in Wayne county, Michigan, and in Kansas City, Missouri, laid in 1909. In both cases the pavements looked practically as good as new and showed very little signs of wear or abrasion. The Wayne county pavement was a 1-2-4 mix with gravel, while the Kansas City street was paved with a 1-2½-4½ mixture with crushed rock for the aggregate. Both pavements seem to wear away evenly with the mortar, leaving a surface resembling a natural conglomerate or "pudding-stone." As near as I could estimate, the wear appeared to be about one-eighth to one-fourth inch in the four years of use, probably averaging not more than one-sixteenth inch per year. Kansas City has laid about 75 miles of concrete pavement on its residence and business streets. All I saw were in good condition.

There seems to be ample evidence that concrete can be made tough enough to withstand many years of heavy traffic. The fact that some defective spots and raveling may have developed in places only shows that those spots were not up to the uniform standard of toughness in the surrounding portions of the pavement, due either to improper mixing or soft aggregate in the concrete. An experience in Pierce county has illustrated this. On one of our roads defective spots developed covering practically 1 per cent of the surface of the entire pavement. These were traced to carelessness or malice in the mixing crew, it being learned through discharged laborers that now and then a sack of cement would be left out, unbeknown to the contractor, while the inspector was watching other parts of the work. I am satisfied the contractor was honest and wanted to do good work, but the result was, nevertheless, that each lean batch showed up conspicuously and raveled after several weeks of traffic. Each of these spots is being cut out and replaced with a proper mix at the contractor's expense.

Since many pavements observed have withstood the grind of traffic for five to seven years without appreciable wear, that is, not more than one-eighth to one-fourth inch, it is not unreasonable to infer that concrete can be made tough enough to withstand twenty years without wearing off more than one-half to one inch. If,

however, the life of a concrete pavement should be only twenty years while that of a pavement twice as expensive is forty years, it would be the height of economy to build a concrete pavement and entirely reconstruct it every twenty years, because the interest on the amount saved on first cost would amount to enough each twenty years to rebuild the road every twenty years forever, while the expensive pavement would be entirely gone at the end of forty years. This is saying nothing of the compound interest which would further furnish a fund more than ample for maintenance.

The maintenance of concrete pavement consists principally of replacing improperly mixed spots, should any occur through carelessness or otherwise, and in refilling expansion joints and cracks with hot tar every year to seal the break and prevent raveling of the edges, an inexpensive and simple matter. In Wayne county, one mile is treated in one day with a crew of five men and one treatment a year is found sufficient. In Kansas City the maintenance expense is also insignificant. A smooth concrete pavement offers less resistance to traffic than either an asphalt or a brick pavement.

There will probably be more failures and disappointments in concrete pavements within the next few years than in any other type of pavement. These will be due to faulty specifications, careless workmanship, and defective materials.

New Inventions in Safety Treads

The American Mason Safety Tread Company, Lowell, Mass., has just issued its 1914 catalogue, which shows a splendid assortment of treads which this concern is turning out to meet the demands of the trade. A number of new inventions are shown, including an improved anchor for tread on concrete. This is said to be a very decided improvement over the old cast-iron anchor formerly used. A new-style safety tread and cork composition mat for revolving doors is also listed in the catalogue. Architects will find the book a handy reference when writing their specifications.

A Change in Firm of Langford, Felts & Myers

H. S. Miller of Fremont, Ohio, former sales manager for Lauth-Jorgens Motor Truck Co., has bought out the interest of Garfield Myers of Langford, Felts & Myers, manufacturers' agents, of San Francisco, and will remove to San Francisco within the next few weeks. Mr. Miller will take the management of the motor truck and machinery lines represented by Langford, Felts & Myers, which include Pacific Coast agency for several important Eastern concerns, including the Lauth-Jorgens truck. Mr. Myers is now with the Lansing Company.

Edison Concrete Houses

Every one of the twenty double houses in Concrete City, the model village of the Delaware, Lackawanna & Western Coal Company, is now occupied, and press reports state the structures are a success. Each house is two stories, built of solid concrete, with flat roofs and dark green trimmings. They are molded in one piece. Each house contains seven rooms and has stationary washtubs, a buttery and a good, dry cellar.

Bennett to Beautify Ottawa

In competition with the world's greatest city planners, Edward H. Bennett, who designed the grounds and buildings plan of the Panama-Pacific Exposition, has been awarded the contract for the City Beautiful plan of the city of Ottawa, the capital of Canada. Ottawa's plans for a beautiful city contemplate the expenditure of over $200,000,000.

Build a Test Highway.

(From the Examiner.)

Railroads carry the heaviest vehicles driven at the highest speeds.

The foundation of these roads is soil, the second course is wood, the surface is steel. Thus the roads have not only strength, but elasticity. Imagine a railroad built of ties and rails laid on a thin bed of concrete.

The essentials of good highway construction are the essentials of good railroad construction—strength and elasticity within reasonable bounds of cost. Without elasticity there will be indurability. Without durability the cheapest highway costs too much.

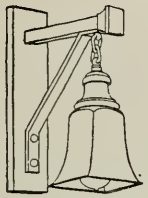
Macadam roads were ideal for wagon travel. They have proved inefficient for automobile traffic. Painted concrete is neither strong nor so elastic as macadam. It is not reasonable to expect such construction to stand up where macadam has fallen down.

The automobile has upset all road-making practice. Engineers are as much in the dark as anybody. Nobody knows what is sound road construction today. But somebody will find out before long. Somebody always does solve any great and urgent problem of constructive engineering.

Before we spend the huge sum of $18,000,000 in building roads it is the part of simple business sense to find out how to build good, durable roads.

If the State Highway Commissioners spend these millions in building roads which will go to pieces in three to five years, they never will hear the last of the people's execration of their folly and extravagance.

Let us have a test highway and so be sure that we are right before we go ahead.



Heating and Lighting

Plumbing and Electrical Work

Methods of Heating Various Types of Buildings

By HARRY H. ANGUS
Consulting Engineer, Toronto, in Contract Record

HEATING and ventilation may be accomplished by the use of hot air, hot water or steam, as the medium for carrying the heat. The question of deciding upon the best medium to use depends largely on the type and size of building in which the heating plant is installed. Generally speaking each system has its special field, although this is not always the case.

In general, buildings may be divided into four main divisions as follows: (1) residences; (2) schools and public buildings, in which ventilation as well as heat is required; (3) buildings, such as factories, warehouses, etc., in which no ventilation is required; (4) buildings in which the ceilings are very high, such as boiler shops, foundries, and some large churches.

Taking these buildings in this order, we have residences as the first division. These are almost always heated either by hot air furnaces or by the hot water gravity system.

The main points in favor of the furnace system are: (1) low cost of installation; (2) heating combined with ventilation; (3) the rapidity with which the system responds to light service. In case of dwelling houses a furnace can be installed for about one-third the cost of any other system. It is also quite evident that ventilation may be very easily obtained with this system. In order to do this, it is only necessary that the furnace draw its supply of cold air from outside. The amount of fresh air entering may be easily varied by adjusting the size of the inlet through which the outside air must enter. The rest of the air to be heated is drawn from the floors of the heated rooms. The owner, with a system of this kind, is thus free to secure the quality of ventilation he desires up to a certain point. Of course, the cost of operation rises rapidly as the quality of ventilation increases, as it requires much more fuel to heat a cubic foot of outside air up to the temperature required than to heat a cubic foot of air from the floor of the room when the room is kept at ordinary temperature.

The main disadvantages of the hot air furnace are: (1) the difficulty of heating the windward side of the house; (2) the contamination of the air supply by the fuel gases leaking through the joints in the furnace; (3) the cost of operation when outside air is circulated.

There can be no doubt that the natural draft from the hot air furnace is very weak and any difference in pressure will tend to force the air along the line of least resistance. If, however, this system is well designed, and both a heat flue and a vent flue are supplied in each room, the trouble is not so serious as with the usual system installed, in which the vents are only taken from one or two rooms. The contamination of the air supply, by the fuel gases leaking through the joints, can be avoided by proper construction of the furnace, and by keeping it in good repair.

In connection with the inlet and vent pipes, probably one of the worst troubles is that due to dust and dirt accumulating in the flues and being later blown out into the room by the velocity of the air. The flue gases in many cases do sooner or later get into the rooms, due to leaky joints which are not usually repaired.

The cost of operation, as before stated, depends largely on the amount of fresh air entering the furnace. If the outside air is entirely closed off, there should be no great variation between the cost of operation of the hot air system and that of any other system. The hot air furnace consists essentially of two shells, one inside the other, the fire being placed in the inner shell, and the air to be heated circulating in the outer shell. In the case of some of the larger furnaces, however, the outer casing is omitted, and the furnace is enclosed by walls usually of brick, and the air to be heated passes through this chamber. In order to get over the dryness of the air when heated to a high temperature, furnaces are usually supplied with water pans which keep the air saturated.

In the case of large furnaces where ducts are long and nearly horizontal, a fan is sometimes used to force the air along the ducts, the fan being located

between the fresh air inlet and the furnaces, so as to keep a slight pressure on the furnace and thus prevent the escape of the fuel gases as much as possible.

The other method of heating residences is by the use of hot water which is circulated by radiators, and there can be no doubt that, for the better and larger residences, this is the most popular system. The main advantages with the hot water system are that it does away with openings in walls or floors, which are dust collectors and to a certain extent unsightly; also that the circulation of hot water is independent of air currents, and it is just as easy to get the hot water to flow to one part of the house as another. The hot water radiators also are usually placed under the windows where they are most effective.

Hot water also retains its heat, and, therefore, it is easier to keep a house at an even temperature than with hot air. Also the hot water system is free from the leakage of fuel gases into the different parts of the house, as sometimes happens with the hot air system. There are a number of other advantages of the hot water system in residence work, but it is believed that these are the main ones. Its great disadvantage, of course, is that there is no ventilation of the rooms, and this must be effected by opening windows and doors, causing drafts.

HEATING SCHOOL AND OTHER PUBLIC BUILDINGS

We come next to the class of buildings such as schools and other buildings where a large number of people are congregated into a comparatively small space. In these buildings the question of ventilation is an important one. Such buildings were at one time heated by hot air furnaces, but their use has been practically discontinued and the usual practice now is to use a certain amount of radiation in each room, and also to supply a certain amount of air to each room, the air being heated usually slightly higher than the temperature of the room. The direct radiation, which is usually steam in the larger buildings and hot water in the smaller ones, supplies the main part of the heat; the air, which is taken from outside and heated, usually by passing over steam or hot water coils, and then forced into the room by means of a fan, supplies the ventilation. The main reason for use of the two systems is that the ventilation is only required while the rooms are occupied, and as soon as the occupants are out of the rooms, the fan is shut down.

Unless some heat were supplied of course the rooms would then rapidly cool off, and it is partly to provide against this that direct radiation is installed. It can be readily seen, of course, that it costs considerable to operate the ventilating apparatus, as the cold air is drawn in from outside, heated, blown into the room, and exhausted at the room temperature, which means that a great deal of the heat in the air is wasted. When it is remembered, that in buildings of this class, the air is usually changed about six times per hour, the cost of operation is readily understood.

With a system of this kind, the amount of direct radiation required is, of course, less than if the ventilating system were not used, as the hot air coming in at a slightly higher temperature than the room, and also being forced in under a slight pressure, prevents the cold air from leaking in as the air in the room is under a slight pressure.

The use of both a heating and ventilating system, of course, costs considerably more to install and operate than if the building were heated by either system by itself. Occasionally buildings are heated by forced hot air altogether, but as stated before, this usually results in considerable waste of fuel, as the air is taken from outside. If the air, instead of being taken from outside, is re-circulated in the building, it is still necessary to run the fan, which not only takes considerable power but requires a regular attendant on the job all the time. If the fan is shut down over night in such a system, the rooms get chilled before morning, and it takes some time to get them warm again.

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WAREHOUSES AND OFFICE BUILDINGS

Coming to those buildings which are heated and not ventilated, we have such buildings as warehouses, office buildings, etc. A great many buildings, of course, which have no ventilation should have it, but it is omitted on account of the cost. There is no doubt that every building, where the number of occupants is large compared with floor space, should be ventilated. There are, however, a number of buildings, such as warehouses, storages, etc., where the results would not warrant the additional cost. These buildings are usually heated by either steam or hot water. Gravity hot water system is, of course, limited to smaller buildings, as the force circulating the water is not sufficient to guarantee circulation in a building where the friction losses are great or the runs long. In such cases forced hot water is used, that is, the hot water is forced through the building by means of pumps. The main advantages of this system are: (1) economy of operation, due to fact that water may be circulated at any temperature or any speed, thus giving the man in the engine room practically control of the heating. This may be readily seen from the fact that steam must be 212 deg. F. or more so that on a mild day the rooms are too warm, and the occupants must open and close the radiators. With the hot water system the temperature of the water may be varied to suit the outside temperature.

Other advantages of hot water over steam are: mains may be run to suit contour of building, no drips being necessary as with steam; large storage capacity, which means ease in keeping uniform temperature. Where steam is used it may be either circulated under slight pressure or by some vacuum system. The question of deciding between steam and forced hot water heating, depends largely on the use to which the building is to be put. Where there are groups of buildings to be heated by a control plant, there is no doubt that the forced hot water system is the most popular, and most efficient, and the simplest since its economy of operation is not dependent on the adjustment of delicate parts, such as thermostats, and the same temperature is maintained year after year. The main limitation to the use of forced hot water is the height of the building and where this height exceeds one hundred feet, the pressure becomes so great on the radiators and connections that there is liable to be considerable leakage.

FOUNDRIES AND MACHINE SHOPS

The other class of buildings is those with high ceilings and large window areas, such as foundries, machine shops, etc., and these buildings are usually heated by the forced blast apparatus, although pipe coils are sometimes used. For such buildings the cost of installation is probably not much different, but the cost of operation of the fan blast system is usually slightly less than with direct radiation. There are, however, other advantages which point to the fan system as the best one for this work.

In buildings of this kind there is difficulty on account of the heated air rising to the roof, and passing out through the ventilators. This acts like a chimney, and draws in cold air through every opening around the windows and doors at the floor level, causing bad drafts, and also wasting a great deal of heat. The fan system, by delivering air at a slight pressure, does away with this leakage, as the pressure in the building is slightly higher than that outside.

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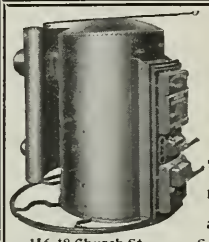

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Then, if direct radiation is to be used it is difficult to get a suitable place to locate the coils except around the outside walls, but with the fan system the pipes are usually run overhead, and openings can be left at suitable places, and the air is forced through and so can be more evenly distributed. Also with direct radiation on account of the coils being close to the walls a good deal of the heat is radiated through the walls without affecting the temperature of the building, while the fan system heats the air itself. Fan systems also heat the air up much more rapidly in the morning, as if the cold air inlets are closed the fan rotates the air of the shop through the coils heating it up slightly every time it passes through. It is comparatively easy, with the fan system, to remove smoke, steam and dust, through the monitor. A fan system should have its inlet so arranged that it can draw its air either entirely or partly from outside or from the shop.

Another disadvantage of the pipe coils is that they are liable to be broken or damaged, and there is also a long run of pipe around the building which must be kept in repair. The fan system, having one central location, and merely air pipes running around the shop, is free from trouble of this kind.

The usual method is to run the hot air pipes about fifteen or twenty feet above the floor, but, sometimes, the air ducts are run underground, and in some cases the air is carried up in the posts of the building, which are made hollow for this purpose. The usual apparatus consists of a power-driven fan which draws the air through steam-heated coils, and forces it through ducts to different parts of the building. Sometimes the air is only partly heated before entering the fan which blows it into a chamber, and from here the air passes through heating coils at the bottom ducts, where it is finally heated and passed into the room.

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Scott Company Succeeds the John G. Sutton Company

The John G. Sutton Company, well known San Francisco heating contractors, has been reorganized and will, in the future, be known as the Scott Company. William P. Scott is president, H. M. Van Pelt vice-president and C. J. Dowdy secretary. Mr. Sutton retires entirely from the company, as it is his intention to devote himself to the management of the Ocean Shore Railroad. Messrs. Scott and Sutton had been associated together since before the San Francisco fire. At that time the business was carried on under the name of John G. Sutton & Co. In 1906 the company incorporated as the John G. Sutton Company, Mr. Sutton being the president, Mr. Scott vice-president and Julia A. Scott secretary. Since the fire the company has executed some of the largest heating and plumbing contracts on record and the work has in every instance given full satisfaction.

Notable heating and ventilating installations were the St. Luke's Hospital, Hearst or Examiner Building, Realty Syndicate Building, Colorado Apartments at Sutter and Taylor streets, Moody Building, Oakland, Mt. Zion Hospital, Stewart Hotel Annex, Heck Investment Company's Building and the Yosemite Theater. Many residences and smaller buildings were wired or heated by the company and at the present time a heating plant is being installed in the palatial James Flood residence and the plumbing is being put in the Food Products and Transportation buildings of the Panama-Pacific Exposition.

In the new Tivoli Theater the Sutton Company did all the plumbing, heating, tiling and ventilating and installed the automatic sprinkler system. Sprinklers were also placed in the Raphael Building at Second street and South Park, warehouse for Major Tilden on King street and the Helbush garage at Van Ness avenue and Geary street.

School contracts aggregating $250,000 have been successfully undertaken. At present the Orville C. Pratt Building is being equipped with a sprinkler system. The equipment is known as the Associated Automatic Sprinkler Company's devices. One of the most successful installations was 160 sprinklers in the plant of the South Bend Lumber Company at South Bend, Washington. A fire broke out soon after the pipes had been laid and before any other water supply had been provided. The pumps were started and the fire was extinguished with comparatively small loss.

The Ten Greatest Inventions

"What are the ten greatest inventions of our time?" asked a scientific journal recently. It awarded the prize to the contestant sending this list: The electric furnace, the steam turbine, the gasoline automobile, the moving pictures, the aeroplane, wireless telegraphy, the cyanide process, the induction motor, the linotype, the electric welding process. And all this was accomplished in a quarter century. Can you name off-hand seven of the inventors?—Power.

A Gas-Pipe Ghost!

What chance has a ghost these days? asks Colliers. An old Back Bay house was thought to be tenanted by "ghouls, ghosts, goblins, wraiths and banshees," until Prof. Schneider of the Massachusetts Institute of Technology investigated—and then had a man mend a leaking gas pipe. Some psychology!

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Death of Mr. John H. Schumann

The many Pacific Coast friends of Mr. John H. Schumann, Sr., founder of the well-known varnish house, the Moller & Schumann Company, will be shocked to learn of his death in Brooklyn, N. Y., on December 31, aged 74 years. A native of Germany, Mr. Schumann came to this country about sixty years ago, and in 1863, under the firm name of Moller, Knaepp & Co., he started in the varnish manufacturing business. After about six months he and Mr. Moller bought out the entire business, and Mr. Schumann was active in the business up to four years ago, when its complete management was taken over by his four sons.

When Seth Low was Mayor of Brooklyn, Mr. Schumann was Civil Service Commissioner. In 1897 he was a candidate for president of the Board of Aldermen on the Republican ticket.

Mr. Schumann was president of the German Savings Bank of Brooklyn and a director in the Title Guarantee & Trust Company, and the Citizens' Trust Company. He was a charter member and vice-president of the Broadway Bank, which was merged into the Citizens' Trust Company. He was a charter member of the Manufacturers' Association of New York, in which he was active for many years. Mr. Schumann also belonged to the Hanover Club, Oltman's Lodge, No. 446, F. & A. M., and the Crusaders' Lodge, No. 61, I. O. O. F.

Ernest Martin Hoen

Ernest Martin Hoen of the firm of Seadler & Hoen, architects in the Forum Building, Sacramento, died at his residence in that city January 9. Death was due to pneumonia.

Mr. Hoen was born in Santa Rosa forty-three years ago. He had been engaged as an architect in Sacramento many years, and at the time he was stricken he was supervising the remodeling of the City Hall.

Mr. Hoen was one of the best known professional men in Sacramento. He was a member of the Masons, the Elks and of San Francisco Chapter, A. I. A.

Jas. K. Pickering

James K. Pickering, one of the best known construction engineers on the Pacific Coast, died Christmas week at his home, 3038 Fulton street, Berkeley, of a complication of diseases after an illness of several weeks.

He was superintendent of construction on the Municipal Auditorium in San Francisco, being employed by the Panama-Pacific Exposition Company. He came to California from Boston in 1905 to superintend construction work on the Monadnock Building, San Francisco.

Electricity and the Fire Hazard

Whenever there is a fire whose origin is a mystery, it is always put down as "probably due to crossed wires." Electricity is made the goat, whether it was really to blame or not.

This attitude of the public and the press—or should we say, the public because of the daily press?—is understandable when one considers that in the early days of electricity, when proper equipment and safe means of insulation were not yet developed, a disproportionate number of fires had without question their origin in defective wiring. The fire hazard from this source has, however, been much decreased in late years, and while it may be freely admitted today by the friends of electricity that about three per cent of the fires are due to this cause they seriously object to having so great a burden of opprobrium put upon electric wiring.

Of the two or three per cent of fires which can without doubt be traced in some way to electricity, it is declared by those who are working with it daily that at least 75 per cent of such fires arise from causes which are avoidable. The safe handling of electricity is a science which is constantly advancing at a rapid pace. With present-day tendency to more and more rigid inspection and regulation, it may be expected that in a short time fires due to electricity will be reduced to a very small number.

Polk Taken for a Counterfeiter

The architect friends of Willis Polk will be interested in the following newspaper yarn which recently appeared in the San Francisco Examiner:

In the fashionable municipality of San Mateo, where he thought everybody knew him, Willis Polk, architect of international fame and resident of Hillsborough, was charged with being a counterfeiter by a clerk, who threatened to summon Chief of Police Aldon McComb if he did not "pay in good money" for articles purchased. The architect blames the Pacific Union Club indirectly for his being mistaken for a counterfeiter. This is the story as told by Polk to his fellow clubmen at the Burlingame Country Club shortly after the occurrence.

"I had occasion to do a little shopping in San Mateo for Mrs. Polk during the noon hour. The clerk who waited upon me branded me as a counterfeiter when I attempted to pay him with new coins which had been given to me in change at the Pacific Union Club.

"'You are a counterfeiter,' he shouted, 'and your money is counterfeit.'

"He grabbed the package out of my hands and threatened to call in the town's chief of police if I declined to pay him in good money. For a moment I was aghast, thinking that probably I had unknowingly offered him spurious coin. Then I recalled one of the new rules of the club to the effect that all the change given at the clubhouse be in new money."

Polk concluded by stating that at first he considered he would let the clerk in on the joke. But he altered his plan by searching in his pocket for old money with which to pay for the merchandise, much to the disappointment of the clerk, who appeared anxious to have the "counterfeiter" imprisoned.

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By the Way

Some Industrial Information Worth the While

"Safe Exit," a Universal Demand

THE scores, aye hundreds, of dire horrors caused by doors locked on a stampeding audience (children and adults), have caused people to look around for preventatives. Unquestionably one of the most perfect devices to date is the Von Duprin Self-Releasing Fire Exit Attachment.

These devices are maintaining their position in the front rank because of design, excellence of material and workmanship, positive action which can not fail to operate, and durability.

The makers of the Von Duprin latches refer to hundreds of their latches that show no sign of deterioration after years of service on schoolhouse doors—the severest test that can be applied.

Our greatest concern is for our children.

Several years ago the school boards in some of the larger cities and towns began to equip their new buildings with Von Duprin Safety Devices to permit of free egress and since then a great many of the old buildings have been similarly equipped.

The demand for protection of this kind has increased to such an extent that today, in most of the progressive cities, the authorities have made it obligatory upon the contractor to equip a new building with adequate safety devices. The buildings included are schools, churches, theaters and halls. In several instances State Legislatures have passed laws to this effect.

The Von Duprin latches are in use on hundreds of theater doors and thousands of school doors all over the country, from ocean to ocean and from gulf to lakes, and in Canada from coast to coast.

Here is an extract from the report by the Government Architect of New South Wales, Sydney, Australia:

"From a very careful examination of the whole contrivance it is a most excellent device, and if the door is properly fitted its working is so smooth that it should be always in good order and ready for any emergency.

"In doors furnished with Von Duprin latches, it is almost impossible for a jam to occur in case of a rush of people, as very slight pressure on the bar brings the mechanism into operation. I consider the invention excellent in every respect, and in every case where its introduction may be contemplated in buildings holding large congregations of people, I would give it my unqualified approval and recommendation.

"(Signed) GEO. McRAE,
"Government Architect, N. S. W."

The Treasury Department of the United States recently made a decision after a very thorough investigation of various types of panic devices. The first building to be equipped is the Bureau of Printing and Engraving in Washington, D. C.

Another department of the United States Government to use these devices extensively is the Municipal Department, many of the devices being used on the schools in the District of Columbia.

In order to show the standing of the Von Duprin latches in the eyes of the architects and engineers at home, attention is called to the fact that every school, theater and public hall in Indianapolis, where the Von Duprin hardware is manufactured, is equipped with the Von Duprin latches.

All of the churches in the same city that have any safety devices are equipped with Von Duprins.

A list of the cities and towns in which Von Duprin latches have been applied to schools, churches, theaters, halls, factories, stores and hospitals would fill a number of pages. It will suffice to mention only the cities where all of the schools are thus equipped:

Denver, Colorado; Colorado Springs, Colorado; St. Paul, Minnesota; Minneapolis, Minnesota; St. Louis, Missouri (500 sets); Indianapolis, Indiana; Dayton, Ohio; East Orange, New Jersey; Butte, Montana; Massillon, Ohio; Winchester, Indiana; Richmond, Indiana; Muncie, Indiana, and Vancouver, B. C.

Wherever there has been open competition the Von Duprin latches have invariably won first award.

The Majestic Coal Chute

The Majestic Foundation Coal Chute has become a common commodity and has been on the market for the past six years.

The object of the manufacturers is to furnish a neat, strong and convenient device for depositing coal, wood or vegetables into the building where the damage usually occurs when a Majestic Chute is not used. The Majestic Chute protects the building, the door locking open prevents the coal or dust from coming into contact with the building at all, and when coal is thrown in carelessly it strikes the door and drops into the hopper, without a particle of damage to the building or scattering the coal upon the walk or lawn.

Thousands of beautiful houses have been very sadly disfigured by not having the protection of the Majestic Chute.

It was the need of such a device that prompted the inventor to perfect it, since which time they have come into general use and thousands of buildings are now equipped with Majestic Chutes, which prevent them from becoming disfigured.

The Majestic Store Coal Chute was designed by a prominent architect in the city of Chicago, his object being to provide a neat, safe and burglar-proof receptacle for depositing coal, wood or vegetables into the cellar of a store building or any

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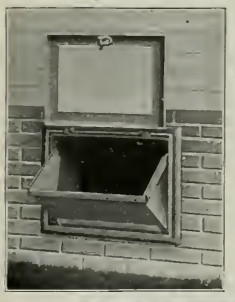
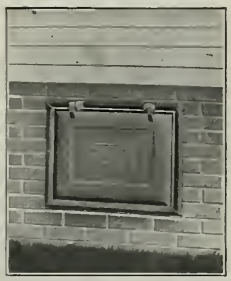
class of building where the grade line or sidewalk and floor are on the same level, in which case the regular Majestic Foundation Coal Chute could not be used.

In a number of the larger cities an ordinance has been passed compelling the owner to give a bond to the amount of $10,000 to insure the city against loss by accident caused from passers-by slipping into the coal opening in the sidewalk.



Open



Closed

The Door and Frame are made of heavy cast iron and provided with slotted hinges to hold the door open, protecting the building when coal is being thrown in. The door is also provided with a heavy, self-closing gravity latch, which can be opened very conveniently by means of a chain and pulley, from the inside only. The Hopper is made of 12-gauge steel.

The Majestic Coal Chutes are handled here by Sherman Kimball & Co., N. E. corner First and Howard streets, San Francisco, who carry a stock in warehouse so as to ensure immediate delivery.

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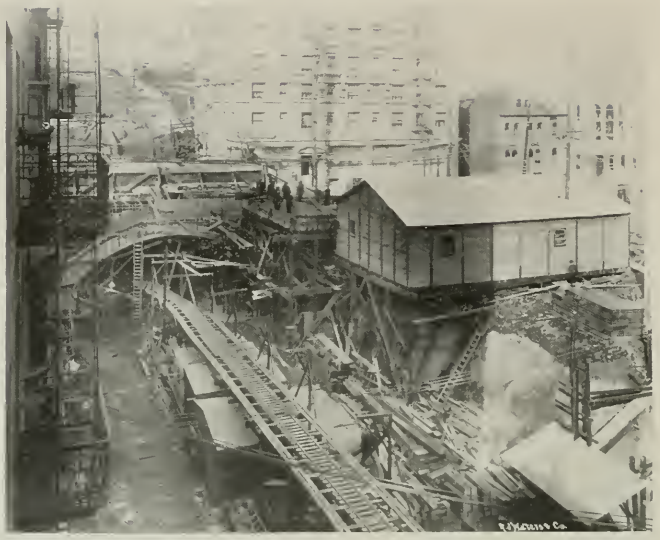

Progress photo of Stockton street tunnel, San Francisco. The sand, rock and gravel used in the concrete work is being furnished by the California Building Materials Company, Pacific Building, San Francisco

Inspecting Engineers in New Quarters

The Robert W. Hunt Company, whose main San Francisco office has been at 418 Montgomery street the past three years, is now located on the sixth floor of the Charleston building, 251 Kearny street. The steadily increasing volume of business of this firm, with its consequent demand for larger and more central quarters, explains the reason for moving. The Robert W. Hunt Company occupies an enviable position in the building industry throughout the country. Its work as inspecting engineers and chemists is so well known that further reference to it here would be superfluous. Suffice is to say that the company is growing, as evidenced by its removal to larger quarters, the opening of coast branches in Los Angeles, Portland and Seattle and the material strengthening of its corps of inspectors and engineers all over the country. In Los Angeles Mr. Howard C. Blake, C. E., has recently been placed in charge. Mr. Blake is a graduate of the Boston Institute of Technology and was for some time associated with Architect C. W. Dickey of Oakland. An electrical engineer has also been added to the Southern California staff in the person of G. W. Middleton, formerly of Chicago. In the new San Francisco quarters Mr. W. B. Gester will continue in charge with an able staff of specialists in steel and concrete. Both the executive offices and laboratory are now under one roof, which must add very materially to the company's efficiency.

New Trus-Con Waterproofing Hand Book

We are in receipt of a copy of the complete edition of the Waterproofing Hand Book just issued by the Trus-Con Laboratories, Detroit, Mich. This is the most comprehensive publication on Waterproofings, Dampproofings and Technical Paints that this company ever has issued. In it you will find a large amount of new scientific information appearing in print for the first time.

The Trus-Con Hand Book clearly differentiates between various methods of waterproofing and dampproofing, showing the best methods of treatment for specific conditions. Integral waterproofing is covered fully with numerous specifications and directions, explaining clearly how mass concrete can be absolutely waterproofed.

The various methods of dampproofing exposed surfaces of concrete, stucco, brick and masonry are discussed, and various products indicated to insure the most satisfactory results.

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An Elastic Floor Tiling

David E. Kennedy, Inc., No. 2 West 45th street, New York City, have issued a pamphlet illustrating Arrowlock Elastic Tiling in a form that will be appreciated by architects. This catalogue can be taken apart without mutilation, and its leaves placed in the appropriate divisions of the specification files for easy accessibility.

Arrowlock Elastic Tiling, the makers state, is a utility floor that is distinctly structural in character. These tile are made from a composition of which cork is said to be the basic ingredient, and, it is claimed, possess the advantages of a cork floor with unusual decorative features. In shape these tile can be supplied square, oblong or interlocking, and in many colors and shades.

It is further stated that these tile have long-wearing qualities, are non-absorbent, and when used with Arrowlock cove base are a thoroughly sanitary floor covering.

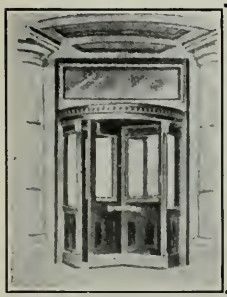
The pamphlet referred to, together with sample tile, will be sent on request.

Nonpareil Insulating Brick

We are in receipt of an attractive booklet just issued by the Armstrong Cork Company, entitled "Nonpareil Insulating Brick." It describes a new product designed for the insulation of boiler settings, furnaces, breechings, stacks, kilns, bake-ovens, etc. This insulating material is said to possess mechanical strength sufficient to enable it to be used structurally. It will also resist relatively high temperatures.

For many years there has existed a real need for a heat insulating material which would combine low heat conductivity with mechanical strength sufficient to enable it to be built in as a part of the structure itself. This need has made itself particularly felt in connection with boiler settings, superheaters, and ovens and furnaces of various descriptions where the insulating medium must, in addition to the two requirements just mentioned, be able to resist relatively high temperatures.

To meet this demand, Nonpareil Insulating Brick have been placed on the market. In Europe a similar product has been available and, in fact, in general use for the past fifteen years. Hence, while Nonpareil brick are new in one sense, they are not new in the sense of being experimental in character. They have been fully tested under various service conditions and are giving universal satisfaction.



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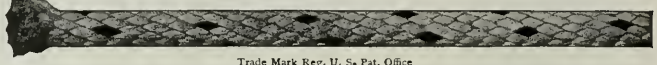
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A New Door Hanger

The Reliance Ball-Bearing Door Hanger Company of 1 Madison avenue, New York City, and having coast branches in San Francisco, Los Angeles, Portland and Seattle, has just issued Circular No. 21, entitled "Make an Entire Side of Your Garage or Stable Disappear."

It is claimed that this feat can be accomplished with a Reliance ball-bearing door hanger, which will carry a door eighteen to twenty feet wide and nine feet high so easily that a child can operate it. All that is necessary, according to this pamphlet, to secure this easy action and wide opening, is to divide the door into three parts, securely fasten one of the three divisions to the hanger, attach each of the other two parts to it on opposite sides by means of hinges, and the door is made complete. Fold the two outside doors over on the center one and the third door can then be pushed either to the right or left, allowing exit from building on either side.

The same device can also be used to partition floors, by folding the doors up as described above and sliding all three doors into a pocket on one side.

A desirable feature of this door is the fact that two of the sections may be securely locked by means of flush bolts, allowing free use of the other section, which can also be locked at any time in the ordinary way, to the jamb. When using these doors the floor of the garage is built about one inch higher than the bottom of the doors, which makes a stop and prevents water from blowing under them. No other guide is required at the bottom of the doors.

It is said that even heavy doors slide easily and almost noiselessly on this ball-bearing hanger, and the two swinging doors on either side of the center one, which alone is attached to the hanger, are handled in the same manner as any hung door.

Complete description and illustrations of this product are furnished in the circular referred to, which may be had upon application.

An Elevator Story

People who go to apothecaries to have their diseases prescribed for occasionally get very strange diagnoses. One day a farmer wearing a long countenance is said to have entered an apothecary's shop and remarked:

"I seem to have something queer in my stomach and I want you to give me something for it."

"What are your symptoms?" the apothecary asked.

"Every little while something seems to rise up and then settle back again, and by and by it rises up again."

The apothecary put his chin in the palm of his hand and meditated.

"Look here," he said gravely, "you haven't gone and swallowed an elevator, have you?"

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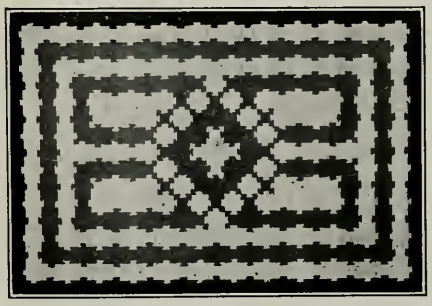

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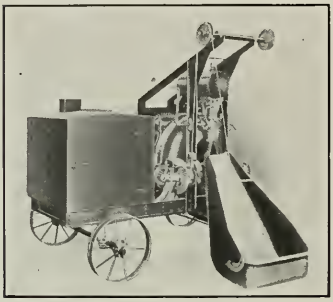

The Koehring Concrete Mixer

IN THE selection of a concrete mixer the first consideration should be the choosing of a machine which will produce the largest quantity of mixed concrete with the least manual labor and which at the same time is simple in construction, economcial in use of power and so dependably built that it possesses the longest life with the least cost for repairs. The Koehring Machine Co., Milwaukee, Wis., makers of the concrete mixer illustrated herewith, claim that it fulfills the requirements mentioned. It is mounted on a truck with gasoline engine, side loader and water-measuring tank. The cut shows the charging side of the machine and the mechanism for operating the side loaders. The mechanism is supported on a steel frame of rigid construction. The drum is cylindrical in form with heavy, slightly rounded cast heads. Near the longitudinal center of the interior periphery of the drum is an angular row of low flat buckets, alternating with long, slightly rounded diagonal mixing blades, which are arranged to carry the material alternately to each end of the drum, and the inner end of the discharge chute when in mixing position extends a considerable distance into the drum and slopes downward. In mixing by the rotation of the drum the buckets cut through the contained material at the bottom and carry portions of it up and pour it from the sides. The mixing blades also cut through at the bottom and carry material up and discharge it alternately from end to end, breaking it over against the heavy heads of the drum. There are three independent mixing actions, constant and opposed to one another, producing a continuous intermingling of all material. The drum does not tilt to discharge. A double gear drive is used so that in the case of stripping of threads through accident to either gear, the remaining gear is strong enough to operate the mixer. The discharge chute is made in two pieces—the outer end being stationary and the inner one pivotal, thus affording clearance for wheel-barrows. The trunnion rollers are keyed to the shaft in a manner similar to that of a railroad truck, the two rollers on each side of the drum being carried on a single shaft which makes the shaft rotate with the rollers. Attention is called to the fact that the charging bucket is short, wide and low, which permits the use of a very compact steel hoisting frame entirely self-contained on the mixer without supporting feet and therefore facilitating the transfer of the equipment. The construction of the buckets makes possible the elevation of the bucket to an almost vertical position in the emptying of material. These machines can be provided with an extension side-loader, which permits the filling of the loading bucket when the machine is elevated above the ground. The friction clutch is of the improved toggle link type, designed to permit the replacement of parts without the dismantling of the machine or the removal of the shaft. With the Koehring water-measuring tank the necessary amount of water required for a batch can be regulated and the adjustment made without the use of a wrench.

The Koehring line of paving mixers is carried in stock by Harron, Rickard & McCone of San Francisco.

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THE scientific name for ordinary rusting is *auto-electrolysis.* This means that the rusting of steel or impure iron, when in contact with rain water or drainage water is parallel to the corrosion which takes place in an ordinary voltaic cell or galvanic battery.

¶ The areas of pure iron form the positive poles of tiny electric batteries, and the particles of manganese-oxide, manganese-sulphide, copper, carbon, or any other substance which is electro-negative to iron, the negative poles.

¶ The more completely these are removed in the purifying processes, the less will be the galvanic action, and the more permanent the material.

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Colonial Fireplace Company Loses Its Factory

The large number of customers on the Pacific Coast of the Colonial Fireplace Company will regret to learn that the company's big plant was totally destroyed by fire November 15. However, a new and more modern plant already is under construction and will be finished by early spring. The following announcement has been sent out by the company:

On Saturday night, November 15, our plant was almost totally destroyed by fire. Serious disasters have their bright side, however, for the many expressions of sympathy and offers of assistance received from friends throughout the country, are most gratifying and help to remove much of the sting from troubles of this kind.

We have not lost courage and have established temporary quarters on the old site where we are still filling orders as rapidly as possible, under the circumstances, and hope that you will bear with us if any of our shipments to you have been delayed.

By next spring we expect to be located in our new factory, more fully equipped and better arranged than ever before, to fill orders for Fireplaces and Fireplace Furnishings as it is our special desire that prompt service shall rule, and we trust that the Colonial Fireplace Company will continue to receive a share of your patronage.

Safety Treads

A form of safety tread for use on stairways, thresholds, ramps and other places where there is considerable traffic, and where a safe and sure footing is essential, is illustrated in a pamphlet issued by Universal Safety Tread Co., 141 Milk street, Boston, Mass., with branch offices in San Francisco and Los Angeles. The pamphlet illustrates a number of important installations for public service, school houses, elevated structures and railroad buildings. The makers state that these treads are adapted for use on wood, iron, concrete or stone, and that they can be made and supplied in widths up to 12 inches in one piece and of any desired length.

They are constructed of a heavy steel base plate, in which openings are punched, making regular rows of teeth. Strips of lead, specially designed and hardened for durability are pressed into the openings, clamped into position by the teeth and clinched or riveted to the base plate. This method, the makers state, insures a constantly increasing wearing surface of lead and in this way provides a safe and sure foothold under all conditions.

A later type manufactured by the same company consists of a steel plate to which is practically welded a non-slipping composition of lead and corundum. It is stated that the wearing qualities of this surface are remarkable, while it is as effective a non-slip tread as could be desired. It is particularly recommended for locations subjected to unusually heavy traffic, and would seem to offer advantages that will command the attention of those in search of a really efficient and durable safety tread.

Concrete Roads and Pavements

The above is the title of a volume of 228 pages, by Mr. E. S. Hanson, editor of The Cement Era, Chicago, and author of other works on cement and allied lines.

While the book appeared only last August, it is already in its second edition. It covers practically everything so far known regarding concrete roads and pavements, taking up first the advantages of this material for this purpose, and following this with suggestions as to the best practice in their construction, the different methods employed, detailed descriptions of road and pavement construction at various points, a description of patented concrete pavements which are on the market, an extensive chapter on tests which have been made on roads and pavements, also chapters on bridges and culverts, sidewalks, etc. An extensive appendix gives a number of sets of specifications for roads and pavements, including the standard specifications which have been adopted by the American Concrete Institute, the specifications used in Wayne county, Michigan, specifications for various patented pavements, and other specifications, which will be found of much value.

The book is well illustrated throughout with half-tone plates and drawings, and makes, altogether, a most valuable handbook for the road builder.

It is published by The Cement Era, Chicago, and is sold at the low price of $1.00.

Quaker State's Fair Building

Henry Hornbostle of Hornbostle & Jones, New York, has been commissioned by the people of Pennsylvania to design and erect their State building at the Panama-Pacific Exposition.

"From conversation I had with Governor Tener just before leaving," said Hornbostle, "I believe the Liberty Bell will be sent to the exposition. Aside from this and the movies, Pennsylvania will send no exhibit except such paintings and sculpture by Pennsylvanians as will be used to adorn the walls of the building.

"The Pennsylvania building at the exposition will be a very attractive structure. The State will spend $80,000 or $100,000 on it, and I have planned a building of which I believe the Californians as well as the people of Pennsylvania will be justly proud. It will be of the type of colonial structures erected in the early days of Pennsylvania."

Joins Brick Company's Sale Department

L. S. Collins, formerly manager of the Spanish Mission Tile Company of Los Angeles, is now connected with the sales force of the Los Angeles Pressed Brick Company. Mr. Collins is well known to the building trade and his many friends will be pleased to learn of his new connection.

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A Pointer for the Steel Men

John Sheron, an inspector in the employ of the Robert Hunt Company, Chicago branch, writes as follows:

"There is one thing I want to mention in regard to the fabrication of structural steel for high buildings. On all buildings that I have inspected, in which wind brace girders were required, I have had a hard time trying to make the shop keep the end wing plates square and parallel. Wind brace girders are very often thrown out of square if the riveter does not exercise care and drifts a bad hole in the wind plates or end connection angles, and it often happens that the ends are not flush. If the architects would specify that the girders must be riveted in a frame, the result would be good workmanship in every respect, and time saving to the shop. Most of the girders for the Field Annex building in Chicago were put up in a frame and they were fine. The girders that were not put in the frame either had to be milled square or the wing angles cut off and squared up. The girders placed in a frame were riveted at a lower cost and better results obtained for the customer."

Briggs' Bituminous Solutions

"Concerning Corrosion," is the title given an attractive booklet recently mailed to its customers and others by the Briggs Bituminous Composition Company of 17 Battery Place, New York. The book is illustrated with photographic plates of bridges, battleships and steel structures that have been painted with Briggs' solutions or enamels. Briggs' Tenax solution is intended for all manner of structural steel work exposed to corrosive influences. It is said to provide a tough, glossy coating that will withstand exposure to the severest climatic conditions without effect.

An Architectural Detail

The Owner—"In my new house I want a simple breakfast room in addition to the more elaborate dining room."

The Architect—"I see. What you want is an oatmeal mush room and a grilled mushroom room."

Provident

Her Pater—"Young man, what prospects have you?"

Reggie—"W-why, sir, I've got almost enough cigarette coupons saved up to furnish a flat!"

Workmen's Compensation—Who Pays the Piper?

From now on contractors will be forced to raise their bids about five per cent to include the expense of carrying liability insurance, for the new Workmen's Compensation, Insurance and Safety Act goes into effect the first of next year. Materialmen will be compelled to add a percentage to the prices for their materials equal to the cost of their liability insurance.

The cost of insuring against liability for accident to or the death of employes increases by just that much the cost of erecting a building or of producing the materials of which it is built. Every employer will be forced to carry insurance, ranging from two to five per cent of the payroll, according to the hazardousness of the occupation. But the employer will not, of course, have to pay it. The purchaser must foot the bill.

Thus the "common people" have the cost of living raised just that much, and the workman who benefits pays his share. Not that the idea of workmen's compensation for accident is not a wise and desirable policy, for it is needed. The law should not, however, be confiscatory, should concede that the employer has some rights, and should be thoroughly equitable to both sides. Probably the only way such an equitable law can be worked out is to actually put it into effect, amending it from time to time as defects prove themselves.—Southwest Contractor.

Moves to Larger Offices

The Fidelity & Deposit Company has moved its offices from the Mills Building to the seventh floor of the new Insurance Exchange, where they are very comfortably located and have increased facilities for handling their business, which will very naturally be largely increased by reason of the new Boynton Compensation and Safety Act which became effective January first.

Architects Elect Officers

J. B. Lyman of the firm of Bristow & Lyman has been elected president of the San Diego Architectural Association to succeed W. S. Hibbard, who filled the position three years. Chas. Cressy of Quayle Brothers & Cressy, was chosen vice-president, and Robert Hally, Jr., secretary and treasurer.

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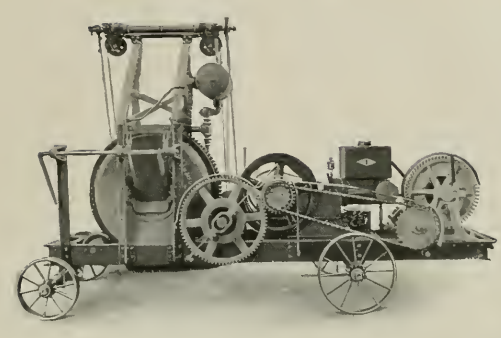


A Marsh-Capron Combination Mixer and Hoist

Combination Mixer and Hoist as One Unit.

The Marsh-Capron Manufacturing Company of Chicago have again added an outfit to their line which has caused a sensation. For years they have been experimenting with a combination mixer and hoist as one unit. After a great deal of money spent in engineering and experimenting they have developed a complete line consisting of Marsh-Capron Rail Track Mixers with single drum friction hoist which they can furnish with gasoline engine, steam engine and boiler or electric motor. Their circular describing these combinations shows photographs of some large work scattered in different parts of the country on which these combination rigs are being used.

On inquiry among some of the big contractors we are advised that this combination outfit is filling a long-felt want. It does away with considerable labor, makes a simple outfit and saves not a little in plant investment. There is one outfit to buy instead of two; one purchase price to pay instead of two; one engineer to run it instead of two.

The Marsh-Capron line is handled in San Francisco by Langford, Felts & Myers, Rialto building, who have a branch office at 413 Hibernian building, Los Angeles.

Big Concrete Amusement Pier

Provided the necessary permit is obtained, a large amusement pier is to be constructed on the ocean beach at San Francisco. It will be located at the terminus of the Municipal Railway adjoining the Great Highway, south of the Cliff House. At the location given there is a depth of about 18 feet of water at a distance of about 1,000 feet seaward from the Great Highway.

The pier will consist of reinforced concrete piles carrying reinforced concrete beams and floor slabs. The piles will be 22 inches in diameter and will have a mushroom base. They will be jetted down into the sand to a depth of not less than 20 feet. The heads of the piles will be formed by means of haunches upon which will rest the reinforced concrete floor beams. The piles will be spaced 18 feet centers east and west and 20 feet centers north and south. This spacing is recommended because it allows a large waterway for the waves. The deck of the pier will be 21 feet above high water. Aside from the piles necessary to support the pier proper, there will be additional piles to take care of any concentrated loads caused by the superstructure. It is estimated that the cost of the substructure will be $350,000 and that it will take at least ten months to complete it.

The superstructure will be a combination of steel and wood with stucco walls properly weather-proofed. The roof will be tile or other fire-proof covering. The cost of the superstructure will be about $300,000. The superstructure embodies four units, surrounded by a double-deck promenade. Its dimensions will be 750 feet long and 150 feet wide. In the center will be a tower, which has been treated architecturally as the main feature of the design. It is 30 feet square and 150 feet high, surmounted by gardens and the smaller open-air concession booths, forming a Spanish Patio. Adjoining the Patio on the land side will be located the amusement pavilion, 116 feet by 204 feet and 65 feet high, and on the upper side will be a large pavilion containing a dance hall and theater. As planned the former will be 116 feet by 145 feet. The theater will have a seating capacity of 800. A cafe, semi-circular in form, with seating space for 800, will be situated at the ocean end of the pier. One of the important features of the plan is the treatment of the two-story promenade, the lower portion of which will be entirely enclosed with

glass, while the upper deck is left open.

The style of architecture is Spanish Renaissance. The tower will be somewhat similar to the famous Giralda Tower at Seville, and around it will be grouped different adaptions of Spanish architecture. The elevation facing the Great Highway will be decorative with its entrance arch flanked by pylons and the administrative wings. The approach to the main entrance will be by means of an ornamental bridge. Messrs. Coates and Traver are the architects, and Edw. Crowley is the engineer.

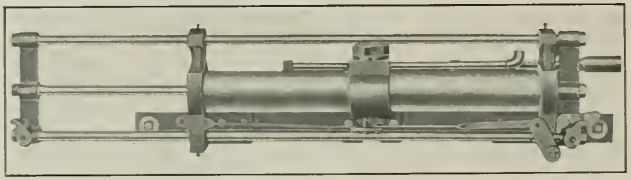
Book Review

BUILDING CONSTRUCTION AND SUPERINTENDENCE, Part II, Carpenters' Work. By F. E. Kidder, C. E., Ph. D. Rewritten and Enlarged by Thomas Nolan, M. S., A. M. Ninth Edition, revised. New York: The William T. Comstock Co. Price, $6.

The appearance of the revised ninth edition of Part II, Carpenters' Work, will be appreciated by architects, and in fact, all interested in construction. The earlier editions of this work were the product of Mr. Kidder's own hand, and as such met with instant favor because of the thoroughness and accuracy of the author. However, in the eight years since the date of the last revision of Carpenters' Work by Mr Kidder himself there have been extensive changes in methods of construction, the use of lumber and in new and patented appliances. Professor Nolan, being fully in accord with Mr. Kidder's methods of presentation, has increased the book and brought it down to date in accordance with present practice.

Without question, this work is the standard for American Practice. It is as complete as it was possible to make it, and every source of information available to the author was made use of. As to the size of the book, its matter is nearly double in amount that of the previous edition and the figures have been increased from 525 to 830; but as many of these contain a number of diagrams, the book really contains over 1,000 illustrations of methods employed in carpentry construction. Even in the tables which comprise the appendix, extensive changes have been made, as many of them have been refigured from more extensive data than was available for the previous editions, and the number has been increased to 50, double that of the former edition.

The division of the book is the same as in the previous edition, the eight chapters covering the building and finishing woods of the United States; wood framing, ordinary construction, sheathing frames, sashes and glazing; outside finish and roofing; interior woodwork; builders' hardware; heavy wooden framing; specifications; and in the appendix, data relating to the strength of materials.



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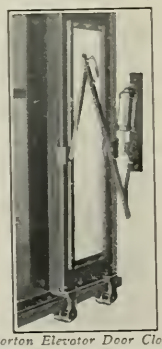

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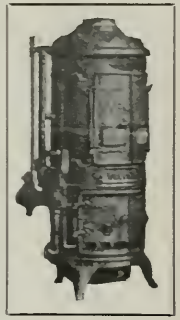

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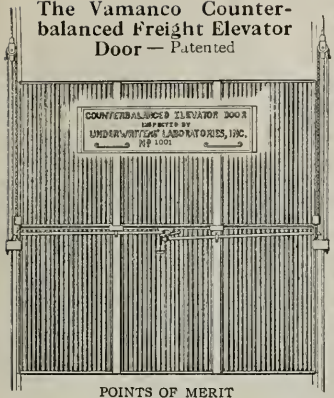

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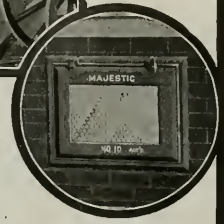

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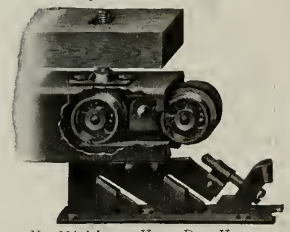

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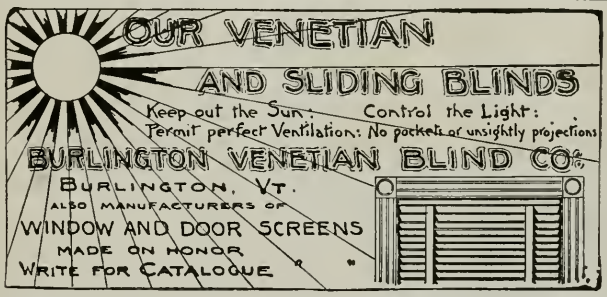

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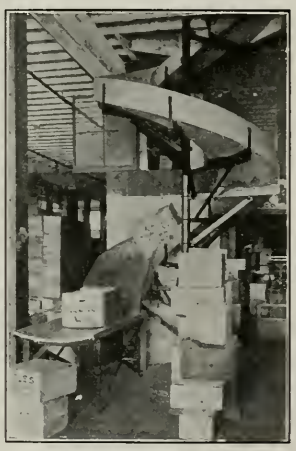

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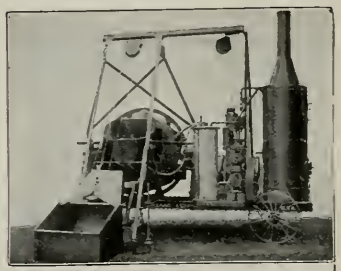

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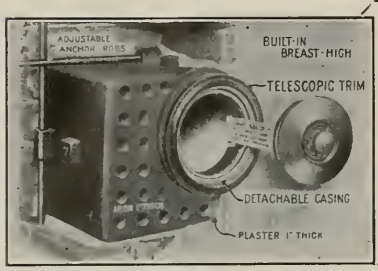

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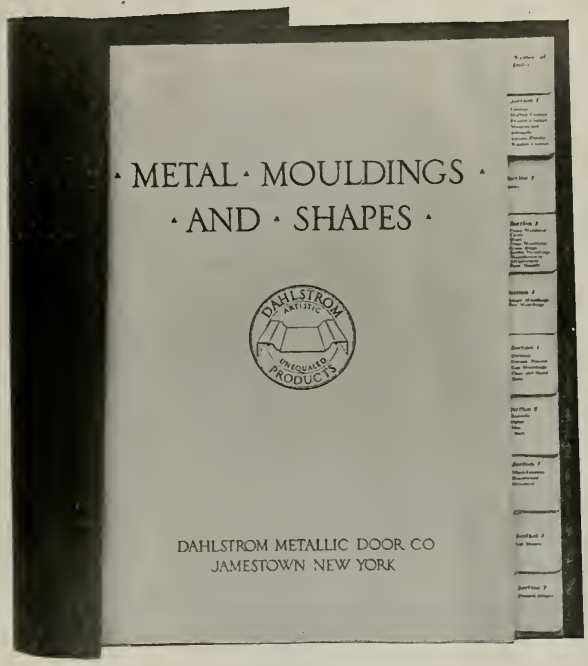

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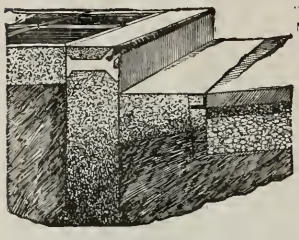

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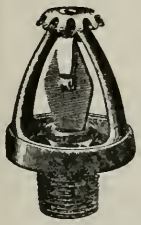

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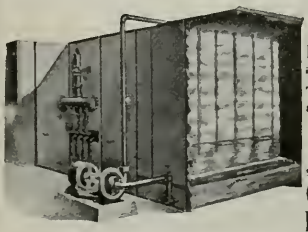

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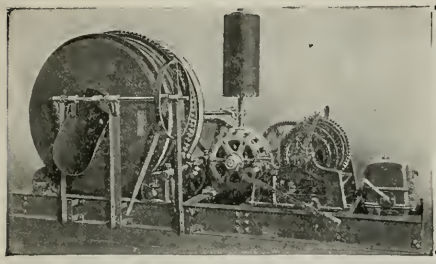

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